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from the proceedings of
The CONCHOLOGICAL CLUB
of SOUTHERN CALIFORNIA

Part II Volume II

John Q. Burch, Editor

1946

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA

December 1945

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. on the first tuesday of each month at 7:30 P.M. All interested persons are welcome. Next meeting Jan. 8,1946.

Please mail all news about our mutual interests to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37,Calif.
Phone AX 2-7965

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The following letter from Dr. Paul Bartsch, Smithsonian Institution, United States National Museum, Washington, D.C. is appreciated.

" Your " Minutes of the Conchological Club ..." have come to hand, and I am rather interested in your treatment of Melanella. May I express an opinion contrary to your conclusions and those of Dr. Keen ?

Bowditch's figure of *Melanella dufresnii* is characteristically that of almost all of your curved West Coast Melanellids. You will find that these have a peripheral angulation like that shown in Bowditch's figure. No *Stylifer* that I recall has such a form, all of which appear to have the last whorl rounded at the periphery. I think Winckworth, therefore, was in error. The typical group of *Melanella* is what I call *Balcis*.

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The Van Cleef Memorial Library, Cornell University, Ithaca, N.Y. - Elizabeth Congdon, Librarian. " I was very much interested in the note regarding early numbers of Nautilus (published as Conchologist's Exchange) on p.43 of the October number of the Minutes.. We have a few of vol. 1 and 2, and would like to secure the missing ones to complete our set. Can you, or any members of your club, give us any help in this project ? We would like to find vol.1, no. 1-4,7 (1886-1887) and v.2, no. 1-8(1887-1888). If you know of the existence of any duplicates of these numbers that are available, we shall be glad to pay a reasonable amount for them."

Professor H.W. Miller, Apartado 1320,San Jose, Costa Rica. We are very happy to have two long letters from our active member. It seems a long time since we enjoyed his company at our meetings. The following are some excerpts from his letters.- " With my wife and two girls that stay with us I spent May 10-12 at the Boca de Barranca, a small twon on the beach near Puntarenas. While it is not the best place for collecting we have seen, neither is it the worst. It offers quite varied collecting grounds, having sand beaches, river mouth, estuary, and rocky cliffs, but is peculiar in that all but the smaller shells are usually too broken up to be of any value in a collection. The four of us brough back about 130 species, some of which were quite broken. Some 25 or so of them were new to our collection. As I have so little literature at hand I wish to correspond a bit with Doctor Hill before I send you a list of the species collected. I was interested in the article by Eyerdam on extended ranges. We also have *Pseudocyrena mexicana* B. & S. here in Costa Rica and Dr. Hill identified a *Donax navicula* Hanley for me in 1940.

Incidentally I found the latter quite common on the beach at the Boca de Barranca this year. As I was not equipped for bringing much material this time I brought back more information than shells. I plan to make a trip to Puntarenas sometime soon and perhaps a trip to Limon on the Caribbean. If I can make it, I have quite a sizable trip planned to begin in the latter part of December or the first of January. I took a hammer and chisel this time and worked the fossil beds as well as the living rock borers. I found fossil Chione,Dosinia,Turritella,Modiolus,Ficus,Polinices,Epitonium,Nassa, Architectonica and some others. The deposits are exposed at median tide and although at sea level are true fossils of a different material from the rocks in which they are found. The material is a translucent crystalline deposit and many of the double bivalves are hollow. Sometimes where the projecting end of a bivalve had been broken by the surf, exposing the hollow interior, there were groups of Littorina aspersa living in the hollow of the fossil. Rather an interesting situation. Saw some alligators also. "

The following is from a later latter. " Since I wrote the other letter I went to Limon, on the Caribbean. A friendand I hiked along about five or six miles of difficult beach (rockand coral with timber and brush right down to the water line, which didnt help much when the tide came in) and I found a number of species alive that I had never taken alive before and a few that I had never taken at all. Then before coming home I gathered a lot of sand from beaches inside the reefs and found a lot of interesting microscopic species that I had never paid any attention to before. I plan to get more specimens of that sand. It is full of interesting things. All dead, of course. Now I want to go back some time and explore the shallow water where they live. It would be easy to spend a month or two just in Limon. Then later I took another friend, a student who comes from the Bay Islands of Honduras and is a shell fan, who, by the way, brought a nice lot of stuff with him when he came, and went to Puntarenas. We got a canoe and a shovel and spent the day on the mud and sand bars in the Estero with little results. It was not the right time of year for that kind of collecting. The mangrove swamps gave a better yield of Littorinas, pulchra,fasciata, and varia all being common. As the collecting was not too good there we went out on the Boca de Barranca where we got over sixty species of dead shells before we even reached the hotel, just walking along a couple of hundred yards of beach, some of them new to me. In all, we got about 130 species at that place and many of them can be taken alive almost any time one wants to go after them. So far I have never had the luck to find the microscopic species numerous on the Pacific Coast. The other two Littorinas that are common on rovk beaches are always to be found here. After the school year is out I will sit down and write you a more detailed description of some of these places where I have collected. "

Professor Miller describes in detail his plans to make use of a motor boat and dredging equipment in the Bay Islands. We look forward with interest to hearing of this excursion.

W.J. Eyerdam- inquires for the address of Lewis who collected in Alaska. The Lewis collection is now in the Los Angeles Museum and no doubt Dr. H.R. Hill can advise about this matter.

Arthur P. Hahnel,Royersford,Penna. is an enthusiastic collector and interested in purchasing fine shells.

Mrs. Effie M. Clark, our efficient secretary, has been very busy lately packing her extensive study collection of fossil shells from the Hilltop Quarry and other deposits. She is donating them to the U.S. National Museum, Wash. D.C .

Mrs. Henry Calcutt,South Berwick,Maine is interested in buying shells.

Max Lorenz,36 Garden Place,Brooklyn, N.Y.C. is interested in buying shells

Minutes of the October,1945 meeting of the Conchological Club of Southern California-

The Conchological Club of Southern California met at the usual time and place Oct.7,1945. There were present 17 members and one visitor, Mrs. Araminta Blanchard,545 S. Hobart St., Los Angeles , who expressed a desire to become a member of the club. Three of those present were members who had been long absent from our meetings- Mr.and Mrs. Gillis for almost three years, and John Brookshire, a flyer from overseas. We were also glad to have with us Mr.and Mrs. Harrt Turver who have not been here long enough to get the habit of regular attendance. We need themand hope they will be with us often. There were no reports of standing committees. The first item of business was a motion which was carried to change the time of meeting back to one of the earlier dates, 7:30 P.M. of the first touesday of the month. The meeting room only will be changed and an appropriate guide will see that those attending will find the proper place. We were given a short talk by John Brookshire who will at a later date tell us more fully of his experiences and show us some of the shell treasures he has brought back with him.

The regular lesson which is outlined elsewhere in the notes used up the rest of the time allotted to us before closing of the museum.

A goodly number of " extras" were contributed by John Burch and enthusiastically " gobbled up". The meeting was then adjourned.

Effie M. Clark, Secretary.

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Walter J. Eyerdam , Port Vita, Raspberry Island, Alaska- " The most notable part of my shell collecting here is that the ranges of Pecten caurinus has been extended about 700 miles N. westward from Wrangel Narrows and the same can be said for the nudibranch Melibe leonina or lion's head altho it is common in Prince Wm. Sound, but I believe has not been reported north of S.E. Alaska. I collected several specimens of this curious animal which is transparent and has an enormous mouth and peculiar appendages. It is so delicate that it falls to pieces from its own weight when taken out of water. It is more fragile than a jelly fish. Specimens up to 6 inches occur in Raspberry Strait.

Day before yesterday the watchman at Iron Creek about a mile from here killed an enormous bear which was becoming too dangerous. I often followed his trail and saw where he slept the night before. Once about six years a go he caused our curer, a Scott with plenty of nerve to dive off a rock into the sea when he suddenly met up with him. A few months ago he swiped a side of beef from the cook house at Iron Creek. Anyway this was the largest bear I have ever seen in or outside of a zoo. Fourteen of us went over to Iron Creek and a lot of photos were taken. Then we dragged him about 100 feet down his own trail. It took 14 strong men pulling as hard as we could on a down slope We had to stop every few feet because of his weight. I dont know how heavy he was. At least 1500 pounds. He was exactly 10 ft. long from his heel to his nose and could reach 12 ft. high. He was very fat and as big around as a barrel. His head was 22 inches wide and front paws 11 inches wide. Yesterday the gang went over again to help skin the bear but he was stinking badly and swolled up. I was the only one that returned to do any skinning, but I decided it was too much of a job, so I cut off his enormous head and stood the terrible stench of rotten blood and grease that bubbled out. The blowflies were there by the thousands. I worked until late at night defleshing the skull which I now have cleaned for my collection. He was a very old bear, perhaps 40 years old. The skull is undamaged. These Kodiak bears are the largest in he world and have great strength. He was so big that he could smash his way right through a house without much trouble. This one was black. The watchman and I dug a big hole and tumbled him into it and buried him. At least his big skull will be a trophy from the king of Raspberry Island. "

Walter J. Eyerdam,7531 19th Ave/. N.E., Seattle 5, Wash. " Last wednesday I returned from Alaska. It was quite a stormy voyage across the Gulf. Most of my things were on a fishing boat. I just got them home yesterday."

Mrs. Agnes E. Wolf, 829 W. Grand, Port Washington, Wisconsin. " I am looking for an Arca chemnitzi and am wondering if you can tell me where I can get a good specimen- both valves. Also, I am told that thwre is a colony of Helix aspersa somewhere in Oakland but cant find where and perhaps you can inform me."

The Oakland Public Museum, Oakland,Calif. sends us their thanks and appreciation of the Minutes.

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Abby Gorham, a charter member of the Long Beach Shell Club recently passed away. She will be greatly missed in Long Beach shell circles.

Miss Julia Ellen Rogers recently suffered the loss of her brother, Dr. Arthur M. Rogers of Los Angeles.

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Miss M. Volk,Teacher, St. Paul's School, 14th St. West,Prince Albert, Sask. Canada. is interested in purchasing shells.

E.J. Post, 609 W. Emma St., Tampa 3,Florida. Our member in Florida is sending us a box of shells for distribution to the members. He reports 64 inches of rain so far this season which sounds like a lot of rain to us here..

Mrs. N. Matzen, Box 768, Escondido,California is welcomed to our shell circle. She is a friend of Mrs. Boerstler of Corona-del-Mar.

Mrs. E.W. Boerstler,P.O. Box 494,Corona del Mar, Calif. " Is there such a thing as a dictionary devoted to shell terms? " * Note* Before many months pass all of our members and subscribers will receive an illustrated glossary that should answer this question. We are working on it now.

" Since the coming of Mytilus edulis diegensis Coe here in Newport Bay, I am unable to find anything which I formerly found wh re it has taken root. They build out all around a pier for 9 inches or more so that everything is smothered even Modiolus capax- Not a Chama or Lucapinella calliomarginata left...... We went out Sat.and Mr. B. got two very lovely pure white Murex trialata , the first white we have found. "

L.M. Wright, CEM, U.S. Navy, Operations Office, Navy Pier 3, Miami,Florida. Please note the new address of our member. We are promised another box of shells although Wright says that the mosquitoes make collecting difficult at this season of the year.

Cpl. Charles B. Lee, 2143 AAFBU, Sq."A", T.A.A.F., Tuskegee,Alabama. "..spent last week end collecting with Morris Jacobson of New York City at Rockaway Quite a thrill as it was my first ocean collecting and I mustadmit going n nearly crazy over my first sight of huge Spissula solidissima in abundance . Really it was a full week end. I have another brother who was redeployed home to Guam. Will you let me know if there are any conchological possibilities." * Note* If that brother in Guam doesnt send you some of the showiest things in your collection it will be because he is mad at you.

Mrs. Laura C. Lawry, 26 Union St., South Berwick, Maine. is interested in purchasing shells.

Miss Mavis Holloway, 32 Pentland Ave., Mt. Eden S.2, Auckland, N.Z. We wish to thank Miss Holloway for her financial contribution to our fundand also for the further issues of the notes of the Auckland Museum Shell Club The latest papers on hand are " Fossil Beds Near Auckland" being a summary of a lecture given by E.S. Richardson, and " Notes on Collecting Our Land Shells" by A.E. Brooks, and " Ecology Notes on Whatipu".

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Minutes of the Long Beach Shell Club- October,1945

After an absence Mr. Baker again was at the helm of the L.B. Shell Club on Oct.14, with twenty three present. Haven't yet decided to change meeting date although the third Friday of the month may be accepted if the room is open. The november meeting we hope to meet on the eighteenth for a collecting trip and picnic over Palo Verde way. Notices will be sent when plans are complete. The Christmas meeting, second sunday of the month, will be held at the Ulrich home. Shell packages will be exchanged and the nominating committee will report as usual. We wish to acknowledge the invitation of Dr. Hill to attend the Nov.6th lecture of Mr. Roughley " Great Barrier Reef" in Hancock Hall, U.S.C. The club also voted to support the Long Beach " Courtesy Campaighn". Miss Rogers then introduced the speakers on the subject " Divisions of the Animal Kingdom."

Miss Higgins described the amoeba as an example of the first phylum, and showed how through a single cell it carried on all the life processes of the higher forms. She showed its connection to man in that many forms caused or were acompaniments to diseases such as trench mouth, dysentery and Texas fever. Man, too, may serveas host to five amoeba, four of the flagellates, and one ciliata. Her final group was the foraminifera, fossils of which indicate the presence of nearlby oil when seen in oil sands.

Grace Ferris showed how the sponge was a many celled mass working together for the good of the whole. She mentioned the sponge fisheries of the world, and spoke especially of the value of different sponges brought up from the Gulf of Mexico beds to the Tarpon Springs pier. Sheep's Wool, yellow and grass sponges were mentioned as ontainable in the markets along this interesting wharf where they were left in the sun to rot the fleshy part, beat to separate and soften the fibres, washed and bleached. As an intwresting and beautiful example of sponge she showed the Venus Flower Basket.

Mrs. Paxon spoke of the jelly fish, a colony of one celled animals, referred to the beautiful and various shapes, some umbrella like, their luminiscence, and the objectionable way some of them flatten out on the sands and sting the unwary bather. Mrs. Paxon has seen the Portuguese Man o War as it moved about in Florida waters by the wind against its gas-filled float.

Miss Rogers spoke briefly of the coral shapes and the spiny skinned group embracing starfish, a radially symmetrical form, and the sea urchin which seems like the former with its arms curved upward and joined together.

Mrs. Ferris has mentioned how the jelly fish becomes at timed flattened out on the sea bottom. This well illustrated the next groups which Mrs. Bormann discussed, the worms, a flattened out creeping animal which revealed a lengthening of body form. This produced what is known as bilateral symetry. Examples of flatworms w re parasitic flukes and tapeworms. The round or thread worms were the vinegar eels, and the parasitic pin worms and the trichina from porrly cooked pork. The garden worm served as an example of a more advanced group, annelida, and the rotifers, polyzoans, and brachiopods represented a worm like group, given alone.

Mr. Baker wanted to claim the brachiopods as mollusks while admitting their separateness. He considers the mollusk an exceedingly important group from the shell club standpoint and quoted a poem showing it is the covering and not the fleshy part shell collectors prefer.

Miss Rogers completed the phyla, telling of beautiful Brazilian butterflies she had seen in South American gardens and referred to the illustrations in Comstock's " Spider Book". She quickly built up the " Life Tree " to man, explaining the brances in relation to each other.

An interesting meeting with a fine review of our high school biology, interppeced with many personal touches.

R.E. Eaton- Secretary.

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New York Zoological Society, 630 Fifth Ave., New York 20, N.Y. have published their September-October issue of Animal Kingdom, the magazine that goes regularly to members. It is a splendid publication.

Earl C. Huffman, 356 Stanton St., Pasadena 3,Calif. contributes the following interesting collecting note.

New Locality for Helminthoglypta tudiculata (Binney).

While visiting the Hitt-Bloomfield ranch, at Spadra,California, four miles west of Pomona, in September,1945, I noticed that a huge limb had fallen from a large umbrella tree. Upon questioning the owners as to the cause of the damage to the tree, I was told that apparently a slight wind had caused the limb to break off, and it was found that the whole interior was in a state of decay, which would soon necessitate the removal of the entire tree. They told me that the tree was very old, having grown there for several generations. I began digging into the core of the old trunk, and found in a few minutes a total of 57 of the Helminthoglypta tudiculata. The owners have promised that when they remove the old landmark, they will be on the alert for more of the shells.

It being such a surprise to find species of this kind about 10 miles from the nearest place- San Antonio Canyon, where they have been discovered, the question arose as to how they got there. A little reminiscing brought to mind the flood of 1913 which came racing across the ranch from the east with a wall of water about 2½ to 3 feet high. They recalled that it filled cellars to the brim, and also swept a neighbor boy and motorcycle into a ditch from the highway in front of their place.

I believe the high water must have carried these shells along from San Antonio Canyon, and that some must have lodged in this old umbrella tree at that time 32 years ago. At some future date I hope to be able to make a further search in and around that locality for more Helminthoglypta tudiculata.

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Dr. A. Myra Keen, Box 1563, Stanford University, Calif. in a recent letter contributed the following items about some of our friends.

" I had the pleasure this week of meeting Lt. V.D.P. Spicer, who dropped in for a few minutes. I have heard that Jack Dowdle may soon be a visitor here on his way home to Los Angeles from New Guinea. Lt. Colonel Hubert Schenck is now Chief of the Natural Resources Division at General Headquarters of the Supreme Commander for the Allied Powers, in Tokyo. He flew from Manila to Tokyo early this month to take up his new duties."

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Mr. A.G. Smith of Berkeley,Calif. and your editor accompanied by Mrs. J.Q. Burch drove down to Stanford University and spent the afternoon of Nov. 11 as the guests of Dr. A. Myra Keen. It was after dark when we left. Between discussing mooted questions, examining sets of specimens of particular interest from the great Stanford Collection, and marveling at some of the rare books, we really put in an afternoon.

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Homer V. Geib, Box 773, Palm Beach, Florida. We were sorry to learn that our good friend had returned to his old home in Florida after having been with us several years but feel a little bit molified by his remark " However, it is my hope to be able to arrange matters, so that I can spend part of the year with you and part of the year in Florida."

Wray Harris, Bishop Museum, Honolulu, T. Hawaii. We feel honored to add this address to our mailing list.

Dr. B.R. Bales, 149 West Main St., Circleville, Ohio. " We espect to spend most of the winter at Marathon, on Key Vaca. If any of the members of the Conch. Club are in Florida and get as far south as the Keys, have them look me up at Marathon and I'll be glad to show them around to the various good collecting localities." The editor for one would surely like to take Doc up on this but must wait until another season.

Additions and Corrections

The following notes received from Mr. Allyn Smith deal with the groups discussed in Minutes #53 and #54.

"The Neosimnia from Monterey is a beauty; have seen nothing like it. Can't decide whether it is new or the true vidleri. If the latter, then my former conception of vidleri is all wrong, and what I thought was vidleri may turn out to be loebbeckeana. You remember I mentioned in my notes the specimens from Monterey with the indistinct white band across the body whorl. Your Monterey specimen is not like this and there are other marked differences. However, you do have a specimen with the white band from southern California, smaller than the Monterey shells in the CAS, but undoubtedly not true barbarensis. The figure of the type of loebbeckeana, given by Schilder and reproduced in outline on page 40 of the last Minutes (#53), show a double dashed line across the middle of the shell. If this was intended to represent a color band, as I think is quite likely, then I think we can settle the shells with the indistinct white band as loebbeckeana. This would then result in the identification of your Monterey specimen most probably as the real vidleri. I am going to write my labels on this basis until somebody comes up with a good reason to change.

Your lot of Neosimnias from Magdalena Bay contain at least two species. the purple ones with the columellar shelf are inflexa. The lighter colored ones with the striations belong to an undescribed species and are like those in the Academy Collection from the same locality.

There is one correction that should be made in reference to Fusinus diminutus Dall in the Minutes #50, p. 36 (bottom). Mac went over the diminutus again while he was in Washington and discovered that the type of diminutus is a real Fusinus, and therefore the species stands. The confusing fact was that there were also specimens of Ocenebra lurida munda in the type lot. My note on this in the Minutes, as cited, should therefore be disregarded. Another correction that also should be made is that the type of F. kobelti as figured by Dall in Proc. USNM, 1891, is from Catalina. Dall says so in the explanation to the figure. Therefore Mrs. Oldroyd was wrong in assigning the type to Monterey. It is true, however, that Dall covered a young specimen from Monterey in diagnosing kobelti, thus confusing the situation. The Monterey shell is another species.

The Ocenebras Beatrice showed me are a puzzle that I doubt if I can straighten out without more information. The Ocenebra epiphanea from the gravel bed off Redondo checks well with the original description and I would not change the identification. However, I have a strong suspicion that epiphanea is a deep water variant of foveolata. More material is needed to settle the point.

There are three species in the material collected by Mrs. Randall at Imperial Beach. One is extremely like our new one from Monterey, so much like it, in fact, that I would almost label it as such. However, I want to see the type of O. squamulifera, which Dr. Keen says is at U.C. before making a final decision. The other two species have me stumped at present. One of them has rather prominent varicial nodes, is rather light in color, with brown markings on the spaces between the varices. This may be O. fusconotata, but I'm not sure yet. The other species appears to be most common at Imperial Beach, judging from the number of specimens that Mrs. Randall collected. The shells of this look like a small edition of O. foveolata. If I had a growth series of foveolata to check against, this would help. Can you loan me a set from your collection ? I don't have any young ones in my collection- neither does the CAS.

The pretty little Amphissa labelled cymata is, I am sure, the color variant called lineata by Stearns. It was figured without description in the Proc. Calif. Acad. Nat. Sci. ser.1, as cited by Dall in Bull. 112.

The figure looks exactly like your shell, which incidentally is the subspecies incisa of versicolor. The description of cymata, which appears to be just another color form, calls for axially waved lines on a white ground- a common form. Your shell has spiral color lines, not axial.

Bittium eschrichtii montereyense Bartsch- Monterey, shore to 10 fms., abundant. Also abundant all along the Mendocino Co. coast. Occasional specimens from Monterey and vicinity show the coarser sculpture of eschrichtii, as given in Bartsch's figure and this is also true of the Mendocino Co. lots. The type of montereyense came from Monterey, as indicated in the table of " specimens examined" in Bartsch's paper. Pleistocene, 3 mi. N. of Cayucos .
Bittium paganicum Dall- 292-356 fms. off Pt. Pinos (USFC).
Bittium attenuatum Carpenter- Shore to 20 fms. in Monterey Bay; common. Lives at low tide among eel grass roots. There are several pretty color forms of this species.
Bittium attenuatum multifilosum Bartsch- I have not collected this at Monterey and so far as I know the only one reported from there is the specimen in the U.S.N.M.
Bittium subplanatum Bartsch- This is as good a point as any to hazard the opinion that the subgenera of Bittium , as used by Bartsch, seem to me to be based on characters that are so variable in many of the ornamented species that their systematic standing is questionable. I would be inclined to disregard them for this reason. If what you say is correct about the variation of subplanatum, then the proper proceedure would seem to require making this a subspecies of catalinense , with inornatum (if it is to be considered valid) another subspecies. The Monterey Bay record for subplanatum is 66-73 fms. off Pt. Pinos (USFC). It appears to be rare in the bay.
Bittium quadrifilatum Carpenter- Monterey Bay, shore to 40 fms. scarce
Bittium quadrifilatum ingens Bartsch- This is now Cerithiopsis ingens B. Bartsch switched the genus in his 1911 paper.
Bittium rugatum Carpenter- Would like some specimens for comparative purposes
Bittium interfossum (Carpenter)- Monterey Bay, beach drift and at low tide.
Bittium tumidum Bartsch- Now Cerithiopsis tumida Bartsch. Same situation as for B. quadrifilatum ingens.
Cerithidea californica (Haldeman)- Not found in the vicinity of Monterey . It is hard to understand why it should not be in Elkhorn Slough, but it evidently is'nt there.
C. californica hyporhysa Berry- Would let it stand.
Caecum californicum Dall- Monterey Bay, 10-30 fms. (Gordon).
Caecum licalum Bartsch- Monterey Bay, 10-30 fms. (Gordon).
Micranellum crebricinctum (Carpenter)- Monterey Bay, 10-35 fms.
Micranellum oregonense Bartsch- Monterey (Bartsch). Dont know it.
Fartulum occidentale Bartsch- 15 fms. off Pacific Grove, Monterey Bay, rare
Bivonia compacta Carpenter- Monterey Bay, shore to 25 fms.
Vermicularia fewksii Yates- May be conspecific with eburnea, but this is a pure guess. Yate's paper is exceedingly rare. Some of these days I hope to get a photostatic copy.
Aletes squamigerus Carpenter- Monterey Bay, between tides
Vermiculum anellum (Morch)- 15-25 fms., Monterey Bay
Spirogryphus lituellus (Morch)- Monterey Bay, shore to 15 fms.
Petaloconchus montereyensis Dall- 10-25 fms., Monterey Bay
Petaloconchus complicatus Dall- Not in our Monterey list and is an addition.
Turritella- The latest reference on this genus is: Fossil Turritellas from the Pacific Coast Region of North America, Univ. Calif. Publ. Geol. 26:1-214, pls. 1-41.
Turritella cooperi Carpenter- Scammon's Lagoon (Univ. Calif.); Monterey Bay, 40-60 fms..

(con.)

Turritella jewettii Carpenter- Merriam states that the type is lost and no topotypes answering the description have been found. The type locality is the Santa Barbara region " two miles from the coast and 150 feet high" (Jewett). The only Turritellas known from this region (later Pliocene or Pleistocene, are members of the T. cooperi stock. Merriam believes jewettii to be a variant of cooperi, as it was named by the same author, and that it probably should be allowed to stand. It is not a Recent species.

Turritella sp. Have a set of shells obtained from Mrs. Baldridge years ago that seem different from cooperi. They were evidently obtained in deep water by fishermen off Long Beach. The largest shell measures: length 92.0; diam. 17.2 mm. Another measures 65.0 mm. long. The smallest of the four in the lot is cooperi size, measuring 45.6 mm. long, but has only 17 whorls as against 22 whorls for the largest specimen. Do you have anything like this ?

Turritella mariana Dall- 40 fms. off Ship Rock, Catalina (Gordon).

Tachyrhynchus lacteolus Carpenter- Records in Gordon Coll. as follows: Pr. Wm. Sound (T.S.O.); Departure Bay, B.C.; Gabriola Island, B.C.; Kodiak Id .: Avancha Bay, Kamchatka; Sitka; Monterey Bay, 63 fms.

Tachyrhynchus stearnsii Dall- Off Balboa, 67 fms. (Gordon).

Tachyrhynchus erosus Couthouy- Records in Gordon Coll. are: Sitka; Kodiak Id.; Avancha Bay, Kamchatka- all collected by T.S. Oldroyd.

Family Littorinidae

Genus Littorina Ferrusac, 1822. Type (by subsequent designation, Rang 1829, fide Dall and Iredale), Littorina littoralis. Grant & Gale, p. 780

Bequaert, Jos. C. " The Genus Littorina in the Western Atlantic", Johnsonia #7, 1943, discusses the type designations and history of the genus and most of the subgenera.

" Shell turbinated, thick, pointed, few-whorled; aperture rounded, outer lip acute, columella rather flattened, imperforate. Operculum paucispiral. (Tryon).

Subgenus Littorina s.s.

Dr. Dall described Section Algaroda in 1918 and placed the west coast species squalida under it in Bulletin 112. Bequaert states that the type of Algaroda, by monotypy, is Turbo littoreus Linnaeus, 1758 which would place it in the synonymy of Littorina s.s.

Littorina squalida Broderip and Sowerby, 1829. Cape York, Arctic Ocean to Pribilof Islands and the Oshotsk Sea. (Dall). Type locality, Oceano boreali .

Collecting data: We have one set of this species collected by W.J. Eyerdam at Petropavlosk, Kamchatka in 1928.

Further comment on the subgeneric allocation of the above species is made by Dr. Joshua L. Baily Jr. (Per. Comm. Oct., 1945 as follows: "When Dall described Algaroda as a subgenus of Littorina and made L. littorea the type, he was under the impression that Rang's type designation of L. littoralis determined the type of Littorina s.s. This is the way in which he used the terms in Bull. 112. Later, when he found that Blainville had designated as the type of Littorina, L. litorea in 1828, one year earlier than Rang's designation, he recognized that Algaroda must fall within the synonymy of Littorina s.s. and so stated in Proc. USNM v.63, Art.10, p.3, 1924. The group which was called Littorina s.s. in Bull. 112 must therefore be called Neritoides Brown, 1827, but as pointed out in Johnsonia, this name was preoccupied by Neritoides Meuschen, 1779, so that the next available name, Neritrema Recluz, 1869 must be used for the group represented on our coast by L. palliata Say, 1822 which Dall reports in Bull. 112 from the Pliocene of Nome, Alaska but not known living on the Pacific side."

The following key and list of species is from Mr . A.M. Strong's notebook.

Genus Littorina
Surface sculptured with distinct spiral ridges
. Shell large, over 20 mm. in height
.. Pale grayish or brownish, variously streaked or dotted
Height 30 mm. Magdalena Bay to Peru ....varia
. Shell small, less than 20 mm. in height
.. Spiral ridges roughened by lines of growth
... Whitish, lined or dotted with chestnut
Height 16 mm. Cape San Lucas to Panama.................. aspera
.. Spiral ridges smooth
... White or yellowish, dotted with brownish
Height 15 mm.. Gulf of Calif. to Ecuador .... conspersa
Surface sculptured with close-spaced spiral grooves
. Upper part of whorls concavely flattened
.. Brownish or reddish, with oblique dark flames
Height 35 mm. Panama to Ecuador .... zebra
. Periphery of body whorl angulated
.. Bluish, with oblique solid or dotted lines
Height 10 mm. Gulf of Calif. to Panama .... philippii
.. Whitish, banded with bluish
Ecuador to Chile ....thersites
. Whorls rounded see above .... varia
Surface smooth or with fine spiral striations
. Shell large, over 20 mm. in height
.. Pale grayish or brown, variously streaked or dotted
see above .... varia
.. Darl chocolate, with zigzag white markings
Height 22 mm. Central America to Chile .... peruviana
. Shell small, less than 20 mm. in height
.. Periphery of body whorl more or less angulated
... Whitish or brownish, obscurely banded
Height 12 mm. Nicaragua to Chile .... araucana
... Whitish, with oblique brownish lines
Peru and Atlantic .... ziczac
.. Periphery of body whorl not angulated
... Columella broad and excavated
.... Colors and color markings varied
Height 15 mm. Puget Sound to Magdalena Bay .... planaxis
... Columella not excavated
.... Uniformly dark, or with white axial lines or spots
Height 12 mm. Alaska to Socorro Island .... scutulata
.... Brownish, with fine whitish spiral lines
Height 10 mm. Cape San Lucas to Panama .... pullata

Littorina scutulata Gould,1849.	Alaska to Socorro Island
Littorina planaxis Philippi,1847.	Puget Sound to Socorro Island
Littorina pullata Carpenter,1857	Magdalena Bay to Panama
Littorina varia Sowerby,1824	Magdalena Bay to Peru
Littorina aspera Philippi,1845	Cape San Lucas to Panama
Littorina conspersa Philippi,1847	Cape San Lucas to Panama
Littorina philippii Carpenter,1857	Gulf of Calif. to Guatemala
Littorina peruviana Lamarck,1822	Central America to Chile

(con.)

Littorina araucana d 'Orbigny,1840.	Nicaragua to Chile
Littorina zebra Donovan,1825	Panama to Chile
Littorina thersites Reeve,1857.	Ecuador to Chile
Littorina ziczac Gmelin,1791	Peru, Atlantic

Genus Tectarius

Tectarius galapagensis Stearns (atyphus),1892.	Gulf of Calif. to Ecuador
Tectarius porcata Philippi,1844	Galapagos- Indo Pacific

Genus Peasiella

Peasiella roosevelti Bartsch and Rehder,1939	Galapagos

Discussion of the species reported north of San Diego continued.

Subgenus Littorivaga Dall,1918. Type, Littorina sitchana Philippi,1846 " Comprises snails with a thick turbinate shell, decidedly convex whorls, a moderately high,pointed spire,and a short curved inner columellar edge" (Bequaert).

Littorina sitkana Philippi,1846. Dr. A. Myra Keen advises that the spelling of this species sitchana is an unjustified emendation.
Range: Southern Bering Sea, both coasts, and southward on the east to Puget Sound (Dall). Type locality, Sitka,Alaska. to Crescent City,Calif.
Collecting data: Port Orchard,Washington; Fauntleroy,Wash. on small gravel along the beach (Burch); Strait of Juan de Fuca; Unalaska Island; Vladivostok,Siberia (W.J. Eyerdam); 5 Alaska stations and Victoria,B.C. (Mrs. Kate Stephens); Ellamare,Port Graham,Alaska and Tacoma,Wash (Baker); Hokkaido,Japan(Baker); Forrester Island,Alaska(Willett); Crescent City, Calif.- Young (Cooper).

Littorina atkana Dall,1886. Kyska Island,Alaska and eastward to Cook's Inlet, Type locality, Bering Sea.
Collecting data: Umnak Island, Alaska (Willett).

Littorina aleutica Dall,1872. Pribilof Islands and the Aleutians' from Kyska eastward to the Chika Islands, on isolated inlets. (Dall).
Type locality, Gull Rocks, Akutan Pass, Aleutian Islands.
Collecting data: Umnak Island, Alaska (Willett)

Littorina gronlandica Menke,1830. The Okhotsk and Bering seacoasts and eastward to Sitka,Alaska; Puget Sound ? Also Greenland (Dall).
Type locality,Greenland.
Collecting data: Cook's Inlet and Ellamere,Alaska (Baker); Red Bluff Bay, Alaska (Kate Stephens); Reykjavik,Iceland (Lowe Collection); Sweden (Anderson) (San Diego Museum of Nat. Hist.).

Littorina rudis Donovan,1800. Aleutian Islands to Puget Sound, Also Atlantic.
Type locality, Banks of the Tamar in Devonshire.
Dr. A. Myra Keen comments as follows: " For some years I have been trying to find a west coast specimen that compares favorably with topotypic material. At the National Museum I made the following notes:" West Coast form has lower spire,rounder aperture,with bevelled columellar margin; English form with a tendency toward umbilication. Most USNM specimens seem to be L. sitkana,a few groenlandica." Hence, I have yet to see a West Coast specimen I can confidently call L. rudis."
Collecting data: In view of Dr. Keen's observations the following records are perhaps erroneous but they are what we have been callin rudis.

Port Orchard, Wash. (Burch); Unalaska,Aleutian Islands (Eyerdam); Port Clyde St. George Co Knox Co., Maine (N. Lermond); Tacoma, Wash. (Hemphill); Atlantic and Europe (San Diego Museum).

Littorina planaxis Philippi,1847. From Puget Sound south to Magdalena Bay, Guadelupe and Socorro Islands. Type locality, California Superior

Collecting data: At and above the high tide mark all along the coast, covering all cliffs, breakwaters etc. Easily identified by the flattened columella. Young shells are banded with white and appear quite different at first glance. (Burch); N.E. Guadelupe Island, L.C. (Huey); No., middle and south islands, Los Coronados (Stephens,Baker and Huey); San Martin Island, L.C. (Baker); San Nicholas Island (Lowe); all along the coast to San Francisco (San Diego Museum).

Subgenus Melarhaphe Menke. Type, Melarhaphe glabrata Menke - Turbo neritoides Linnaeus. " comprises snails with a moderately thick, ovate-conical to ovate-turriculate shell, flattened or convex whorls, a high pointed spire, and a long, straightened columellar edge." (Bequaert).

Littorina scutulata Gould,1849. Kodiak Island, Alaska, south to Turtle Bay, Lower California, and Socorro Island (Dall). Type locality, Puget Sound.

Dr. W.P. Woodring comments on this species (Per. Comm.) " You may wish to add under Littorina scutulata that Carpenter thought that L. pedroana Conrad,1855 (Pleistocene,San Pedro) is L. plena. The type is lost."

Collecting data: An odd locality for this species is upper Morro Bay on salt grass stalks. There are no stones for miles and these specimens are of very exceptional size; Fauntleroy,Wash.; Crescent City,Calif.: and almost and piece of rocky rubble along the coast (Burch); Cape San Lucas, L.C. (Lowe); San Quintin Bay (Orcutt); S. Coronado Island (F. Stephens); and along the coast north to several Alaskan localities (San Diego Museum); Drier Bay, Alaska (W.J. Eyerdam).

Littorina pullata Carpenter,1864. Ann. Mag. Nat. Hist. ser.3,vol.13, p.477, June,1864. Type locality, Cape San Lucas. (This is reprinted as Paper C of the U.S. Nat. Museum 1872 reprint, Smith. Misc. Coll. No. 252). Of the holotype at the U.S. National Museum I made the following comment in my notes " Resembles L. scutulata but with incised white lines" The above comments by Dr. A. Myra Keen.

Range: Monterey south to Cape San Lucas, L.C.

Keep and Baily " West Coast Shells" state " It resembles L. scutulata but is of a dark reddish-brown color, sometimes checked with numerous finely sculptured spiral lines."

Collecting data: This color form is fairly common in some localities and not present in others semmingly of the same habitat which would indicate that it is a good race at least. It is common around La Jolla and also at Dana Point,Orange Co. It seems logical though that it should be considered a subspecies of scutulata rather than a distinct species. (Burch).; Bird Rock, San Diego (Dr. Baker); Long Beach (Baker).

Dr. A. Myra Keen comments as follows (Per. Comm.)." Littorina plena Gould,1849. Proc. Boston Soc. Nat. Hist., vol.3, p.84. Type loc., San Francisco. Carpenter lists this as a variety of L. scutulata; I doubt if it is valid even varietally. Gould says of it, " The globoseness of the last whorl is remarkable... It is.. smaller, more polished, and with a smaller aperture than L. scutulata."

Subgenus Algamorda Dall,1918. Type (by monotypy), Baludinella newcombiana Hemphill. The holotype of this species is at the California Academy of Sciences.

Littorina newcombiana (Hemphill),1876. Humboldt Bay, California.
Known only from the type locality.

Keep and Baily " West Coast Shells" state of it " ... has four distinct rounded whorls. The shell is smooth, thin and covered with a brown periostracum. The aperture is nearly circular. The length is about one-fifth of an inch. This species is found in saline swamps about Humboldt Bay, and has so emancipated itself from aqueous conditions, that it is frequently found on the damp ground but above the water."

Mr. A.G. Smith comments on this species as follows: " Types in CAS along with other lots. Gordon Coll. also has a set . So far as I know, no one has collected any since Hemphill took the original lot. The shells are rather thin-textured but have the shape of a Littorina. One would expect to find them in the salt grass or in Salicornia along with Alexia setifer."

Mr. and Mrs. E.P. Chace collected the species in Humboldt Bay and had a set at a recent meeting of the club. Mr. Smith stated that they have the shape of Littorina , but to my eyes they more nearly resemble large specimens of some species of Lacuna. (Burch). There are sets in the San Diego Museum collected by Hemphill.

Littorina subrotundata Carpenter,1865. Neah Bay, Washington.

Littorina castanea Carpenter,1865. Neah Bay, Washington.

Mr. A.G. Smith comments on this species and the former as follows:" Dr. Hanna looked for these recently at Neah Bay but found only the common Littorinas there."

Family Lacunidae

Genus Lacuna Turton,1827. Type (by subsequent designation, Gray,1847), Nerita pallidula (Da Costa).

" Shell turbinated or globular, thin, covered by an epidermis; aperture semilunar, columella flattened, with a parallel groove behind it ending in the umbilicus, lip sharp, arcuated. Operculum paucispiral." (Tryon).

Grant and Gale state " It is possible that there is but one, very variable species in this genus in the California fauna." However, I cannot subscribe to this, because even if we overlook the very different shells the animal.for example of porrecta moves with a different motion than some of the others at least.

However, Mr. A.G. Smith comments:" This genus to my way of thinking is in bad shape and needs careful attention by some one."

Lacuna carinata Gould,1848. Proc. Boston Soc. Nat. Hist. vol.3, p. 75, Nov. 1848. Type locality: Puget Sound. Original description follows:
" Testa parva, tenuis, ovato-globosa,epidermide cornea tenui undulatim striata induta: spira anfr. 5 ventricosis, ultimo carina filosa cincto: apertura semicircularis dimidian testae adaequans; columella rotundata. Long. 3/10; lat. 1/5 poll. In color and marking much like L. vincta."

Lacuna porrecta Carpenter,1864 placed in synonymy on advice of Dr. W. P. Woodring as follows: " Lacuna carinata Gould,1848; type locality, Puget Sound. I consider L. porrecta, the type locality of which is Neah Bay at the mouth of the Strait of Juan de Fuca, a synonym. Modelia striata Gabb,1861 type locality, Santa Barbara, Pleistocene (Gabb's Miocene) is evidently L. carinata, as Carpenter thought."

Dr. A. Myra Keen remarks " As Dr. Woodring has doubtless compared the holotypes, probably his synonymy is correct."

Collecting data: Abundant on the heavy kelp around Crescent City,Calif.

and Point St. George; Fauntleroy,Wash., Puget Sound; Monterey, Calif.; San Simeon, and Cayucos; common in the Pleistocene of Timm's Point,San Pedro. As stated above this species moves with a peculiar waddling motion that seems to be different from the others. (Burch); Crescent City, Calif. (Chace); Monterey (Hemphill).

There are two subspecies of porrecta listed in Bull. 112 by Dr. Dall. Neither of these subspecies seem to have been recognized by any member of the club. They would, of course, now be subspecies of carinata is valid. They are:
Lacuna carinata effusa Carpenter,1864. Fuca Strait to San Francisco,Calif. Type locality, Neah Bay, Wash. and
Lacuna carinata puteloides Dall,1919 ex Carpenter MS. Lobitas, Calif.

Lacuna glacialis Moller,1842. St. Paul Island, Pribilof Group. Also Greenland. Type locality, Greenland.

Subgenus Epheria Gray,1847. Type (by original designation),Tyrbo vinctus Montagu.

Lacuna vincta (Montagu),1803. Dr. A. Myra Keen advises (Per. Comm.) : Lacuna divaricata Fabricius is nomenclaturally unavailable. It may be regarded as both a homonym and a misidentification. The next available name is L. vincta (Montagu),1803. (Test. Brit. p. 307). Type locality: Salcomb Bay, England. Original description of Turbo vinctus Montagu: " T. with a smooth conic shell,with six rounded volutions, of a subpellucid, rufous horn-colour: the lower spire marked with 4, and sometimes 5, purplish brown, or chestnut colored bands,with a broad spece between the 3 lower and the upper ones; in the second and third spires are only two bands: the apex is small, but not very pointed: aperture sub-orbicular; outer lip very thin; inner lip thick, white,furnished with a narrow channel, which terminates in a small umbilicus. Length rather more than 3/8 of an inch."

Range: Norton Sound, Alaska, and south to Santa Barbara,Calif. also Pliocene. Also northern Europe and Greenland.(Dall).

Collecting data: San Lorenze Island, Alaska (Willett); Drier Bay, Knight Island, Pr. Wm. Sound, Alaska (W.J. Eyerdam); Washington (Lowe); Norway, Sweden,England (Anderson) (San Diego Museum).

Lacuna solidula Loven,1846. Skuyak Strait,Afognak Island, Alaska(Eyerdam) south to San Diego,Calif. Also Atlantic.

The description of this species was omited from Oldroyd, and Dr. A. Myra Keen has sent it to us. It follows: " Lacuna solidula,1846. Ofversigt af Kongl. Vetenskaps-Akaremiens Forhhandlingar for 1846(1847), vol.3, no.5, p.155. Type locality: Bergen-Finmark. Original description: " T. oblongo-ovata,solidula, fusca,anfr. convexis,labro patulo,acuto,callo interne incrassato,apert. antice effusa; 9/5.5 mm" (Apparently the dimensions are 9 mm. in height by 5.5. in diameter.)

Grant and Gale consider this a synonym of the preceeding species following Tryon in Man. of Conch.

Collecting data: Departure Bay, Vancouver Island, B.C. (A.F. Tissot); Mole Harbor,Alaska (Kate Stephens); Washington (Lowe).

Lacuna variegata Carpenter,1864. Puget Sound south to Santa Monica Bay(Keen). Type locality, Neah Bay, Washington.

Collecting data: Monterey, Calif. on algae (Burch); Point Vicente (Lowe); Cayucos,Calif. (Lowe).

Lacuna unifasciata Carpenter,1856. Monterey,Calif. south to Magdalena Bay, L.C. Type locality, Santa Barbara, Calif.

Collecting data: This is by far the most common species of the genus in our experience and easily collected in great numbers from algae on shore as well as from the floating off shore kelp. Plentiful in the eel grass and in the eel grass roots. A few stations follow: Monterey,San Simeon, Cayucos, Santa Monica,Redondo Beach,Malaga Cove,Catalina Island,Dana Point,San Onofre, La Jolla, Mission Bay, and Todos Santos Bay (Burch); Reef Point and Isthmus Cove,Catalina Island) Strong); Elkhorn Slough, on broad leaved eel-grass; scarce (A.G. Smith); La Jolla (Chaney); San Pedro and Cayucos (Lowe); Lower Calif. (Hemphill) (San Diego Museum).

Lacuna unifasciata aurantiaca Carpenter,1864. Santa Barbara, Calif. to Point Abreojos,L.C. Type locality: San Pedro-San Diego and Santa Barbara Island.
" Keel obsolete"

Collecting data: San Diego and Catalina Island (Lowe); La Jolla (Bristol); San Diego (Hemphill).

Lacuna marmorata Dall,1919. Saginaw Bay, Alaska to San Diego, Calif. Type locality, Monterey, Calif.

Collecting data: Our experience has been to find this species living on the stones littoral, unlike the above species which seems to be always confined to a habitat on some kind of algae. I have seen stones covered with these shells so that it was possible to simply brush them off into a pail. However, there are a few odd notes on it. We collected several specimens from the back of a large Haliotis rufescens brought up by divers off Cayucos,Calif. from about 35 ft,. A few localities follow: De Poe Bay, Oregon; Crescent City; Point St. George; Morro Rock; Cayucos. (Burch); abundant at low tide on eel grass in Monterey Bay (A.G. Smith); Helm Bay and Mole Harbor,Alaska (Kate Stephens); Washington (Lowe); Monterey (Lowe).

Lacuna olla Dall,1919. Dall,#2295, Proc. U.S.N.M., v.56,1919, p.349. Described as a variety of marmorata.

Subgenus Boetica Dall,1918. Type (by orig. desig.) Boetica vaginataDall. The one species placed under this subgenus does not seem to have been figured U.S.N.M. vol.56, p.349.

Lacuna vaginata Dall,1918. Santa Rosa Island in 53 fms. and OFF La Jolla in 199 fathoms. Type locality, off La Jolla.

Genus Haloconcha Dall,1886. Type (by monotypy): " Lacunella" reflexa Dall. New name for subgenus Lacunella Deshayes. " Shell depressed, heliciform, few-whorled,thin, with a strong epidermis; margin of the aperture thin, with a narrow reflexed margin in the adult,continuous with the thin sharp,unreflected arcuate columella; umbilicated, operculum paucispiral" (Dall).

Haloconcha reflexa Dall,1884. Probilof Islands. Type Loc.-St. Paul Island.

Haloconcha minor Dall,1919. Commander,Pribilof and Aleutian Islands eastward to Chirikoff Island,Alaska (Dall).

Type locality: English Bay, St. Paul Island, Pribilof Group,Bering Sea.

Genus Aquilonaria Dall,1886. Type, Aquilonaria turneri Dall.
Shell lioplaciform, more or less membranous, thin, imperforate,without sculpture, but with a rough, transversely shaggy epidermis.Operculum subspiral

with a raised subspiral rib on the inner side." (Dall).

Aquilonaria turneri Dall,1886. Arctic Ocean near Bering Strait. Also Labrador. Type locality, Labrador's Reef, Ungava Bay.

Family Fossaridae

Genus Fossarus Philippi,1840. Type (by monotypy), Fossarus adansonii Philippi = Turbo ambiguus Linnaeus. Recent, Senegal. Fide Woodring,1928. " Shell perforated, sculptured; inner lip thin; aperture semilunate. Operculum not spiral. " (Tryon).

Fossarus parcipictus Carpenter,1864. Todos Santos Bay,L.C. to Panama. Mr. Strong lists records of this species from Mazatlan,Mex. etc.

Fossarus angiolus Dall,1919. Todos Santos Bay.

It seems very doubtful if there are any California records for either of the above species.

Genus Iselica Dall,1918. Type (by monotypy), Isapis anomala C.B. Adams. " Shell umbilicated, spire elevated, cancellated or with revolving ribs, columella with a small median tooth (almost obsolete in F. anomala) (Tryon).

to Nicaragua (Lowe).
Iselica fenestrata (Carpenter),1864. Puget Sound to/the Gulf of California. Type locality, Santa Barbara Islands and San Diego.

Collecting data: We have this species from Puget Sound to Todos Santos Bay, L.C. Perhaps the easiest way to collect is to examine almost any Mytilus bed. The wharf pilings at least all along the southern California coast will produce any number of them. However, the bathymetric range is also of some interest. We have it dredged in Puget Sound. It was not uncommon in the dredgings off Monterey down to below 20 fms. and it was rather a common species in the dredgings off Redondo Beach, Calif. in the gravel beds at 25 fms. or slightly deeper. Abundant in some of the Pleistocene deposits suchas Hilltop Quarry at San Pedro. (Burch); San Diego (Anderson); Laguna Beach (Lowe); San Pedro (Lowe); San Juan del Sur, Nicaragua (Lowe).

Iselica obtusa (Carpenter),1864. Puget Sound to San Diego. Type locality, San Diego, Calif. in 10 fms.

Collecting data: Dredged off Redondo Beach, Calif. in 25 fms. gravel. (Burch); San Diego, Calif. in 5 fms. (Hemphill); San Diego in 15 fms.(Lowe); Mission Beach (Chaney) (San Diego Museum).

Iselica obtusa laxa Dall,1919. Vancouver Island, B.C. to Puget Sound, Wash. Type locality, Maple Bay, Vancouver Island, B.C.

Additions and Corrections

Lacuna solidula Loven , (Page 14, this issue). Mr. A.G. Smith comments on this species as follows: " Not sure of this identification but refer large specimens found on the beach at Point Pinos to this species. Have also taken it on the Mendocino Co. coast. Believe Chace has it from Crescent City."

The following keys and lists are from Mr. A.M. Strong's notebook.

Family Fossaridae

Genus Iselica

Columella with a small median tooth
• Body whorl with seven rounded spiral ribs
•• Shell pale, rosy, shining
6 x 4 mm. Monterey to San Diego .... obtusa
• Body whorl with nine sharp spiral ribs
•• Shell light yellowish brown
6 x 6 mm. Puget Sound to Gulf of Calif. .... fenestrata
• Body whorl with eight strong, equal spiral cords
•• Shell grayish white
1.5 x 1.2 mm. Bahia Honda, Panama .... kochi
• Body whorl with ten strong subquadrate spiral ribs.
•• Shell white, maculated with purplish brown
3 x 3 mm. Gulf of California .... maculosa
• Body whorl with eleven flat, smooth spiral ribs.
•• Shell white, solid
8 x 3.5 mm. Gulf of California .... ovoidea
Columella smooth .... Genus Fossarus

Genus Fossarus Philippi,1840.

Principal sculpture of from 4 to 6 spiral keels
• Spaces between the ~~wherls-~~ keels smooth
•• Periphery of body whorl angulated
4 x 5 mm. Panama .... foveatus
•• Periphery of body whorl rounded
••• Spire with 2, body whorl with 6 strong cords
2.25 x 1.75 mm. Todos Santos Bay ....angiolus
••• Spiral cords irregular, fading out on body whorl
2.5 x 2.25 mm. Panama .... abjectus
• Spaces between the keels spirally threaded
•• 2 keels on the periphery, 2 on the base
1.5 x 2.5 mm. Cape San Lucas .... lucasana
•• 4 keels on body whorl, 2 usually most prominent
••• Nuclear whorls 2
•••• Nuclear whorls smooth
1.75 x 1.5 mm. Mazatlan .... angulatus
•••• Nuclear whorls finely cancellated
2.0 x 2.0 mm. Cape San Lucas .... purus
••• Nuclear whorls 4, tuberous, cancellated
1.0 x 0.9 mm. Mazatlan .... tuberosus
•• 6 keels on the body whorl
••• Keels regularly spaces
•••• Shell subglobose, white maculated with brown
6 x 5 mm. Cape San Lucas ....parcipictus
•••• Shell obliquely ellipsoid, pale horn and brown
4 x 3 mm. Panama .... excavatus
••• With a wide, flat space between the suture and 1st keel
3.25 x 2.5 mm. Panama .... angiostomus
• Spaces between the keels axially threaded
•• Whorls angular, shell dingy white
2.25 x 2.25 mm. Panama ....megastomus
•• Whorls convex, shell chestnut
2.6 x mm. Panama .... mediocris

(con.)

.. Shell helicoid, white
3.7 x 4.1 mm. Ecuador .... guayaquilensis

Genus Iselica Dall,1918.

Iselica fenestrata Carpenter,1864	Puget Sound to Gulf of California
Iselica obtusa Carpenter,1864.	Monterey to San Pedro
Iselica maculosa Carpenter,1857.	Gulf of California
Iselica ovoidea Gould,1856	Gulf of Calif.
Iselica kochi Strong and Hertlein	Bahia Hohda,Panama

Genus Fossarus Philippi,1840.

Fossarus angiolus Dall,1919.	Todos Santos Bay
Fossarus lucanus Dall	Cape San Lucas
Fossarus tuberosus Carpenter,1857	Mazatlan
Fossarus angulatus Carpenter,1857	Mazatlan
Fossarus parcipictus Carpenter,1864.	Todos Santos Bay to Panama
Fossarus purus Carpenter,1864.	Magdalena Bay to Cape San Lucas
Fossarus atrata C.B. Adams,1852	Panama (abjecta)
Fossarus angiostoma C.B. Adams,1852	Panama
Fossarus excavatus C.B. Adams,1852	Panama
Fossarus foveata C.B. Adams,1852	Panama
Fossarus megasoma C.B. Adams,1852	Panama
Fossarus guayaquilensis Bartsch,1928	Ecuador

Additions and Corrections

We have the following note from Dr. A. Myra Keen " Some time ago I gave you a reference which you quoted, to Buccinum striatissimum, a Japanese species which Stanford has from Bering Sea and Lynn Canal. I now have the original description at hand:

Buccinum striatissimum G.B. Sowerby,III. (Ann. Mag. Nat. Hist. ser.7, vol. 4, no.23 (Nov. 1899), p. 370, text-figure 1). " Testa ovato-conica,crassa, albida, epidermide pallida tenuissime induta,spiraliter striata; spira elongato-conica,acutiuscula; anfractus circiter 8-9, valide convexi,rotundati, sutura impressa sejuncti,spiraliter densissime inciso-striati,striis eximie undulatis; anfractus untimus supra tumidus,infra leviter contractus; apertura subovalis, alba, canali lato, brevissimo; columella antice rectiuscula, postice obliqua, in medio arcuata, callo crasso induta; labrum crassum, leviter reflexum , postice laevissime sinuatum. Operculum typicum." Long. 115, diam. 65; aperture longa 40, lata 26 mm."

Type locality: Kumihama, Tango,Japan. " This fine species is a typical Buccinum, but does not exhibit any of the longitudinal plicae characteristic of B. undatum. The whorls are peculiarly rounded and swollen, while somewhat depressed at the suture. The whole surface of the shell is closely and regularly sculptured with fine waved grooves."

The following interesting note from Dr. A.M. Keen:

" Yesterday I ran across something Dr. Dall and others including me, had overlooked-- that Carpenter had described Ocenebra interfossa var. atropurpurea The reference is: Proc. Acad. Nat. Sci. Phila. for 1865 (Aug.7,1865), p.64: " Costis spiralibus distantibus, in spira duabus, foveis majoribus. Variat. quoque t. albido zonata." The type locality is Puget Sound. This is going to interest Mrs. Bormann.

The following keys and lists are from Mr. A.M. Strong's notebook.

Family Fossaridae

Genus Iselica

Columella with a small median tooth
• Body whorl with seven rounded spiral ribs
•• Shell pale, rosy, shining
6 x 4 mm. Monterey to San Diego .... obtusa
• Body whorl with nine sharp spiral ribs
•• Shell light yellowish brown
6 x 6 mm. Puget Sound to Gulf of Calif. .... fenestrata
• Body whorl with eight strong, equal spiral cords
•• Shell grayish white
1.5 x 1.2 mm. Bahia Honda, Panama .... kochi
• Body whorl with ten strong subquadrate spiral ribs
•• Shell white, maculated with purplish brown
3 x 3 mm. Gulf of California .... maculosa
• Body whorl with eleven flat, smooth spiral ribs.
•• Shell white, solid
8 x 3.5 mm. Gulf of California .... ovoidea
Columella smooth .... Genus Fossarus

Genus Fossarus Philippi,1840.

Principal sculpture of from 4 to 6 spiral keels
• Spaces between the ~~wherls-~~ keels smooth
•• Periphery of body whorl angulated
4 x 5 mm. Panama .... foveatus
•• Periphery of body whorl rounded
••• Spire with 2, body whorl with 6 strong cords
2.25 x 1.75 mm. Todos Santos Bay ....angiolus
••• Spiral cords irregular, fading out on body whorl
2.5 x 2.25 mm. Panama .... abjectus
• Spaces between the keels spirally threaded
•• 2 keels on the periphery, 2 on the base
1.5 x 2.5 mm. Cape San Lucas .... lucasana
•• 4 keels on body whorl, 2 usually most prominent
••• Nuclear whorls 2
•••• Nuclear whorls smooth
1.75 x 1.5 mm. Mazatlan .... angulatus
•••• Nuclear whorls finely cancellated
2.0 x 2.0 mm. Cape San Lucas .... purus
••• Nuclear whorls 4, tuberous, cancellated
1.0 x 0.9 mm. Mazatlan .... tuberosus
•• 6 keels on the body whorl
••• Keels regularly spaces
•••• Shell subglobose, white maculated with brown
6 x 5 mm. Cape San Lucas ....parcipictus
•••• Shell obliquely ellipsoid, pale horn and brown
4 x 3 mm. Panama .... excavatus
••• With a wide, flat space between the suture and 1st keel
3.25 x 2.5 mm. Panama .... angiostomus
• Spaces between the keels axially threaded
•• Whorls angular, shell dingy white
2.25 x 2.25 mm. Panama ....megastomus
•• Whorls convex, shell chestnut
2.6 x mm. Panama .... medioeris

(con.)

.. Shell helicoid, white
3.7 x 4.1 mm. Ecuador .... guayaquilensis

Genus Iselica Dall,1918.

Iselica fenestrata Carpenter,1864	Puget Sound to Gulf of California
Iselica obtusa Carpenter,1864.	Monterey to San Pedro
Iselica maculosa Carpenter,1857.	Gulf of California
Iselica ovoidea Gould,1856	Gulf of Calif.
Iselica kochi Strong and Hertlein	Bahia Hohda,Panama

Genus Fossarus Philippi,1840.

Fossarus angiolus Dall,1919.	Todos Santos Bay
Fossarus lucanus Dall	Cape San Lucas
Fossarus tuberosus Carpenter,1857	Mazatlan
Fossarus angulatus Carpenter,1857	Mazatlan
Fossarus parcipictus Carpenter,1864.	Todos Santos Bay to Panama
Fossarus purus Carpenter,1864.	Magdalena Bay to Cape San Lucas
Fossarus atrata C.B. Adams,1852	Panama (abjecta)
Fossarus angiostoma C.B. Adams,1852	Panama
Fossarus excavatus C.B. Adams,1852	Panama
Fossarus foveata C.B. Adams,1852	Panama
Fossarus megasoma C.B. Adams,1852	Panama
Fossarus guayaquilensis Bartsch,1928	Ecuador

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Type locality: Kumihama, Tango,Japan. " This fine species is a typical Buccinum, but does not exhibit any of the longitudinal plicae characteristic of B. undatum. The whorls are peculiarly rounded and swollen, while somewhat depressed at the suture. The whole surface of the shell is closely and regularly sculptured with fine waved grooves."

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Family Litiopidae

Mr. A.M. Strong in his notebook makes the following comments on this group.

The three genera placed in the family are very different in shell characters, but presumably similar in habitat, i.e. pelagic, living on floating sea weed.

Litiopa is definitely stated as living on floating sea weed. The single species reported from the west coast, L. bombyx Rang, is listed by Tryon as a synonym of L. melanostoma Rang for which he gives a world wide distribution.

Alaba is more or less varicose and in a large series some specimens are almost all covered with varicose swellings and others scarcely show any signs of swellings. Bartsch, in some cases, seems to make specific characters of the lack of varices. All the specimens I have seen,they were taken at almost every dredging station containing small shells from all expeditions, were dead shells which had dropped to the floor of the ocean if they were pelagic as seems to be the case. These shells were more or less bleached and would have lost epidermal colors if such had been present. However,some species have been separated on whatI take to be epiermal colors. I have listed the species as described, but I very much doubt if there is really more than one real species;

The two west coast species placed in the genus Eumete are quite distinct. They are known by very few specimens and as far as I can find out dredged as dead shells. They could easily be pelagic though the shape would not indicate it. The genus may be better known elsewhere.

There seems to be considerable difference of opinion as to the type and definition of the genus Alaba. Woodring probably is correct. I do not know how to treat Carpenter's descriptionand notes in Maz. Cat. His description of nuclear whorls seems to be different from Bartsch 's. I have followed Bartsch in leaving out the various species described by Carpenter. In addition to the reasons given by him the variation of the specimens we have examined is so great that no such close division could be made.

Genus Litiopa Rang,1829.	
Litiopa bombyx Rang,1829.	Southern Calif. to Gulf of Calif.
Genus Alaba A. Adams,1862	
Alaba jeanettae Bartsch,1910.	San Pedro to Acapulco
Alaba catalinensis Bartsch,1920.	Catalina Island
Alaba supralirata Carpenter,1856	Gulf of Calif. to Panama
Alaba interruptelineata Pilsbry & Lowe,1932	San Juan del Sur
Alaba guayaquilensis Bartsch,1928.	Ecuador
Genus Eumete	
Eumete bimarginata C.B. Adams,1852	Gulf of Calif. to Panama
Eumete intercalaria Carpenter,1865	Gulf of Calif. to Guacomo
Eumete eucosmia Bartsch,1911	Galapagos

Family Litiopidae

The genera placed under this family by Dr. Dall in Bulletin 112 have been the source of no little disagreement. Thiele places Diala,Alaba and Litiopa under the family Cerithiidae, subfamily Litiopinae. While there seems to be some question about Diala in the arrangement, it seems that most authors are using the family Litiopidae for these genera.

However, the genus Barleeia is placed under Litiopidae by Dr. Dall with a ?. Thiele places Barleeia in the family Rissoidae, subfamily Barleeinae. Thiele seems to be disposed to use large family groups. It is probable that the genera Barleeia and Diala should be placed in a separate family. It seems to me that the genera of this group differ materially in shell charac-

-ters and may very well be separated further unless perhaps they are related anatomically.

Dr. A. Myra Keen comments " I should advise being conservative in the matter of family names and letting the specialists decide whether new ones are needed. In this case, better follow Thiele, since he has positive ideas and Dr. Dall had only a question mark."

Grant and Gale,1931 place Diala and Barleeia in a family together using the family name ?.

Dr. Joshua L. Baily Jr. comments (Per. Comm.) " In reply to the questions on the bunch of papers beginning with Litiopidae, I would say that there is so much difference of opinion among malacologists as to the first four genera Litiopa,Diala,Alaba,and Barleeia that almost any arrangement is likely to meet with the approval of somebody. My personal preference is different from any of your suggestions, so I shall not complicate matters by giving it to you. I will only say that some years ago I went over the question of Litiopa bombyx versus Litiopa melanostoma and decided in favor of L. melanostoma. Dr. Pilsbry and I went over it together. I forget why.

If you make Barleeia the type os a family, its name ought to be Barleeiidae but the multiplicity of vowels in the middle of this word is likely to make the spelling you suggest more popular."

The family name suggested was Barleeidae.

Genus Litiopa Rang,1829. Type (?) Litiopa bombyx Rang. Mr. A.M. Strong notes " The single species reported from the west coast is listed by Tryon as a synonym of L. melanostoma Rang for which he gives a worldwide distribution." However, I notice that other authors reverse the proceedure placing melanostoma in the synonymy of bombyx.

" Shell minute, conoidal, columella truncated at the base, outer lip simple, notched." (Tryon).

Litiopa bombyx Rang,1829. Southern California and Gulf of California. Pelagic. (L. melanostoma Rang.)

Mr. A.M. Strong has a note on this in his notebook as follows:" Oldroyd gives this as the type of the genus but copies the description of melanostoma rang,1829 given by Tryon as having wordwide distribution and including this species. How can the type of a genus be a synonym of another species described at the same time by the same author ?"

Dr. A.M. Keen advises " For discussion of Litiopa see Palmer, Nautilus v.55, no.4, pp. 128-130 and vol. 58, no.2,p. 70 (in the latter Rang,1929 should obviously be Rang,1829). The only specimens from the west coast which we have obtained I took from beach drift at Punta Ponasco,Mexico. Dr. Schenck sent a number of what appear to be the same thing (though I suppose an expert might find differences) from Oro Bay, New Guinea; they were lodged in the crevices of floating Spirula shells and were alive when collected. The species was omited from my check list because I could not translate such a vague range into terms of latitude."

Genus Alaba A. Adams,1862. Type (by subsequent designation,Nevill, 1885), Alaba melanura (C.B. Adams) (Rissoa melanura C.B. Adams). Fide Woodring,1928, p.340.

" Shell elongate-conic,semitransparent, usually with irregularly spaced hollow,varicose swellings. The nucleus consists of about 4 sculptured whorls which continue the general outline of the spire with scarcely any interruption. The aperture is rather large, oval, outer lip thin, the basal lip curving into the columella without a notch or canal."

Alaba jeanettae Bartsch,1910. San Pedro, Calif. to Gulf of California (Dall). Type locality, Margarita Bay, Lower Calif. /to Acapulco (Strong).
Collecting data: Espiritu Santo Island, Gulf of Calif. and Magdalena Bay, L.C. (Dr. F. Baker)

Alaba catalinensis Bartsch,1920. Catalina Island, Calif. Known only from the type locality. Mr. A.M. Strong comments on this species " The nuclear whorls are not described and no mention is made of spiral sculpture which is present on other species. However, it is stated that the whorls are marked by fihe, retractively slanting lines of growth. Otherwise, the shell would seem to be very similar to Alaba supralirata Carpenter."

None of the members seem to have recognized it locally.

Alaba sp. Reported from Carmel Bay in 25 fms. by Mr. A.G. Smith.

Family Barleeiidae

Genus Barleeia Clark,1855 Type (by monotypy), Barleeia rubra (Montagu). " Shell broadly conic or ovate, with about two microscopically thimble pitted nuclear whorls forming a blunt apex. Postnuclear whorls three or gout, smooth or with microscopic striations. Aperture oval, posterior angle obtuse, outer lip thin, basal lip curving evenly to the junction with the inner lip, body covered with a callus. Shell not umbilicated." (Strong).

See the discussions on pages 19 and 20 and also Mr. Strong's comments on the following page for our conclusion to place all species formerly listed under Diala under the genus Barleeia. However, for the convenience of those who will not agree with this practice the data on the genus Diala follows: Genus Diala A. Adams,1861. Type (by subsequent designation, Dall,1922), Diala varia A. Adams. " Whorls not varicose, sometimes nodulated around the middle; columella straightish not truncated; labrum not thickened." (Tryon).

Barleeia acuta (Carpenter),1864. Puget Sound to San Martin Island (Baker) to San Hipolito (Jordan). Type locality, Catalina Island.

Collecting data: See Mr. Strong's note on p. 23. Dredged off Monterey, Calif. in 15 fms.; off Avalon, Catalina Island in 25 fms.; not uncommon in the Pleistocene of Hilltop Quarry, San Pedro (Burch); Monterey Bay, shore to 20 fms. (A.G. Smith); Monterey (Lowe);

Barleeia exilis (Tryon),1866. San Francisco Bay to San Diego Bay.(Dall). Type Locality, San Diego. None of the members seem to have recognized this species. Barleeia exilis (Tryon).

Barleeia marmorea (Carpenter),1864. Queen Charlotte Islands, B.C. south to San Martin Island, L.C. (Baker). Dr. A. Myra Keen advises " Type locality os Barleeia marmorea according to the holotype label at the U.S.N.M. is San Pedro." This species was listed by Dr. Dall in Bull. 112 as Diala. In Nautilus 35:84,85 1922 Dr. Dall made the following statements:" The shell listed by Carpenter as Diala marmorea though shaped and colored like some of Adams Dialas does not belong to the genus. It has the operculum and radula of Barleeia but differs in having a smooth nucleus while that of Barleeia rubra is thimble-pitted. The rhachidian tooth of marmorea is more squarish than t that of B. rubra as figured by Troschel and has five rounded cusps, the middle one larger...."

Collecting data: Littoral on algae at Monterey,Calif. and picked up in the dredge down to as deep as 15 fms; from backs of Haliotis rufescens from 35 ft. off Cayucos,Calif. (Burch); Monterey (Hemphill and Lowe); So. Coronado Id.(Baker); Monterey Bay to 25 fms. (A.G. Smith);Queen Charlotte Island (T.S. Oldroyd). * Continued on Page 24*

Genus Barleeia

The following comments on this group are from Mr. A.M. Strong's notebook. " Dall puts this genus in family ?, and I have no record of any recent writer suggesting a family name. The genus probably belongs in a family by itself. None of the early writers mention the most characteristic generic thing common to all species, the thimble pitting of the nuclear whorls. This is lacking in the other species lumped by the older writers under Rissoa.

In the absence of sculpture it is hard to put into words the distinguishing characters of the various species and still harder to pick out the key characters. Bartsch makes one of his main divisions on periphery subangulated and periphery rounded. I have never been able to see this distinction in examining the shells. Much depends on the age and angle at which you look at the shell. I have tried to use other characters in my key but doubt if it will work out any better. I expect the color and presence or absence of color bands does not mean anything.

Bartsch makes no mention in his paper of the three west coast species that Carpenter described as Diala, tho he has said in letters that they are probably only large species of Barleeia. They are no larger than his B. dalli and in fact are very difficult to separate from it. I think that acuta Cpr. and marmorea Cpr. should be included in Barleeia. They show the thimble pitting of the nucleus very distinctly. We have never figured out what Diala exilis Tryon is.

Carpenter's Diala acuta and marmorea and Barleeia subtenuis and haliotiphila all date from the Suppl. Report, 1865, but are fully described in later publications. For acuta Carpenter gives the locality as Monterey and Catalina. Oldroyd gives the type locality as Catalina. For marmorea Carpenter gives Monterey and San Diego. Oldroyd gives the type locality Monterey. For subtenuis Carpenter gives Catalina and San Diego. Oldroyd gives type locality San Diego. For haliotiphila Carpenter gives locality unknown, probably Lower California.

Bartsch, in the text, states that the specimen for B. subtenuis Cpr. comes from San Diego and is a typical specimen. In the Explanation to Plates he gives it as B. subtenuis, type. This of course is not correct. The same thing applies to B. alderi Cpr. and B. haliotiphila Cpr. The figures are not of the types and the specimens do not come from the type localities. Should this be correct and if so how ?"

Genus Barleeia

Periphery of last whorl angulated
. Peripheral angle marked with a raised thread
.. Shell more than 4 mm. in length .... dalli Bartsch
.. Shell less than 3 mm. in length .... bentleyi Bartsch
. Peripheral angle not marked by a raised cord
.. Shell more than 4 mm. in length
... Base flattened, almost truncate .... acuta Carpenter
... Base flattly sloping .... marmorea Carpenter
.. Shell less than 3 mm. in length .... zeteki Strong & Hertlein
Periphery of last whorl not angulated
. Shell unicolor
.. Shell broadly conic
... Shell 3 mm. or more in length .... subtenuis Carpenter
... Shell less than 2 mm. in length ....coronadoensis Bartsch
.. Shell not broadly conic
... Shell 2.5 mm. or more in length
.... Aperture comparatively small .... haliotiphila Carpenter

(con.)

.... Aperture comparatively large.......................... oldroydi Bartsch
... Shell less than 2 mm. in length .... carpenteri Bartsch
. Shell banded
.. Whorls strongly inflated ....polychroma de Folin
.. Whorls not strongly inflated
... Aperture comparatively large ....californica Bartsch
... Aperture not comparatively large
.... Whorls narrowly shouldered at the summit.... orcutti Bartsch
.... Whorls almost appressed at the summit ...... alderi Bartsch

Genus Barleeia Clark,1855. Type (by original designation) (Barleeia) rubra Montagu. Recent, British Isles

Shell broadly conic or ovate, with about two microscopically thimble - pitted nuclear whorls forming a blunt apex. Postnuclear whorls three or four, smooth or with microscopic striations. Aperture oval, posterior angle obtuse, outer lip thin, basal lip curving evenly to the junction with the inner lip, body covered with a callus. Shell not umbilicated.

Barleeia acuta (Carpenter),1864. Monterey to San Martin Island,L.C. Shell waxy, polished, shining, with an angulated periphery. The species differs from Barleeia marmorea (Carpenter) in being slightly smaller and with a sharper angulation at the periphery, and from Barleeia dalli Bartsch ,which is about the same size, in the lack of the raised thread at the peripheral angle.

Barleeia alderi (Carpenter),1856 Gulf of California to Tres Marias Islands, Mexico.(Carpenter's listing from San Diego undoubtedly refers to one of the species later described by Bartsch). Type locality, Mazatlan.

Shell elongate ovate with a well rounded periphery and a small aperture. The distinct color banding described by Bartsch is a variable character, faint or absent in some specimens.

Barleeia bentleyi Bartsch,1920. Venice,Calif. to Cape San Lucas,L.C. Type locality, Venice, Calif.

This species resembles Barleeia dalli Bartsch in the raised cord on the angulated periphery but is much smaller and usually darker in color.

Barleeia californica Bartsch,1920. San Pedro, Calif. to Point Abreojos,Mex . Type locality, San Pedro,Calif. This is one of the smallest of the west coast species. The periphery is slightly angulated, the aperture comparatively large, and the brownish color is more or less distinctly banded.

Barleeia carpenteri Bartsch,1920. Off Newport Beach,Calif. to Cape San Lucas Mexico. Type locality, Cape San Lucas. This is a very small, elongate ovate shell with a well rounded periphery. The upper whorls are narrowly shouldered at the summit and the color is given as white. (I have specimens dredged off Newport that were so identified by Bartsch and have extended the range accordingly. I have an idea that the white color is due to bleaching. My specimens are dead but look fairly fresh.)

Barleeia coronadoensis Bartsch,1920. San Pedro, Calif. to Point Abreojos, L.C. Type locality, Off Coronado Islands,L.C.,Mex. in 7-10 fms. This species is similar to Barleeia subtenuis (Carpenter) in the oval shape. The periphery is well rounded and the whorls are rounded and appressed at the summit . It is the smallest of the west coast species and the color is said to be white.

Barleeia dalli Bartsch,1920. Off Point Loma,Calif. in 71-75 fms. This is one of the largest of the west coast species. The periphery is strongly angulated and marked by a raised cord. The color is said to be yellowish white.

Barleeia haliotiphila Carpenter,1864. Mendocino Co.,Calif. to Point Abreojos, L.C. Elongate conic with the periphery slightly angulated. The aperture is rather small compared with other species in the genus and the color is pale chestnut brown.

(con.)

Barleeia marmorea (Carpenter),1864. Queen Charlotte Islands, B.C. to Lower California. Type locality ?. The shell is similar to Barleeia dalli Bartsch but the strongly angulated periphery is marked by a raised thread or cord. The shell is whitish, more or less clouded with faint chestnut axial lines. (I think that Grant and Gale's reference to Baker,San Martin Island is either an error or a missidentification. Acuta is the southern form and marmorea the northern tho Carpenter separated them in Southern California. I am not sure that they are distinct.)

Barleeia oldroydi Bartsch,1920. Mink Bay,Vancouver Island,B.C. to Coronado Islands,L.C. Type locality, Monterey,Calif. This is a rather slender shell with the periphery obsoletely angulated. The aperture is larger than that of B. haliotiphila which is about the same size and also unicolor.

Barleeia orcutti Bartsch,1920. Magdalena Bay,L.C. to Monserrate Island, Gulf of Calif. Type locality, Magdalena Bay, L.C. Shell very small, rather broad, with the periphery well rounded and very narrowly shouldered at the summit. In the type the posterior half of the whorls are diffused with pale brown and the anterior half is white.

Barleeia polychroma (de Folin),1870. Bay of Panama. The whorls are inflated and the periphery obscurely angulated. The colors are variable, with indistinct color bands.

Barleeia subtenuis Carpenter,1864. San Francisco,Calif. to Gulf of Calif. Type locality ? The species is distinguished from the other west coast species in the genus by the large size and broader proportions. Often there is a slight umbilical chink behind the columella.

Barleeia zeteki Strong and Hertlein,1939. Bahia Honda to Taboga Island, Panama. This species has the periphery slightly angulated but without a raised thread. The whorls are only moderately rounded and the apwrture is large and flaring.

* Continued from bottom of Page 21*

Barleeia haliotiphila Carpenter,1864. Mendocino Co., Calif. to Lower Calif. Dr. A.M. Keen advises " Type locality of B. haliotiphila is " probably Lower Calif., from the back of a Haliotis splendens" (i.e. H. fulgens)."

Collecting data: Arbolitos, Lower Calif. (Burch); Santo Tomas,L.C. (Hemphill); Laguna Beach (Lowe); San Pedro (Lowe); San Clemente Island and Monterey (Lowe) (San Diego Museum); 5-15 fms. off Pt. Pinos; also kelp holdfasts. Does not appear to be a shore form in Monterey Bay. (A.G. Smith); Mink Bay, B.C. (T.S. Oldroyd) (A.G. Smith).

Barleeia sanjuanensis Bartsch,1920. Shuyak Strait, Afognak Island, Alaska (Eyerdam,1924) on nullipora under rocks to Puget Sound. Type locality, Gulf of Georgia, Puget Sound.

Collecting data: Elrington Island, Pr. Wm. Sound, Alaska (Eyerdam); Washington (Lowe);

Barleeia subtenuis Bartsch,1920. San Pedro to San Ignacio Lagoon, L.C. to San Martin Island (Baker). Type locality, according to Dr. A.M. Keen was not selected and stands -Sandiego; Santa Barbara Islands.

Collecting data: New port Bay, Calif.; very abundant in Mission Bay, San Diego Co. on eel grass; the Estero below Ensenada,L.C. (Burch); Brackish spring at Carmel (J.G. Cooper). Have not found it in the Monterey region (A.G. Smith); San Diego Bay (T.S. Oldroyd) (A. Smith); Catalina Island (Lowe); San Diego (Hemphill, Lowe and Cleveland); San Diego Bay (Dr. F. Baker); San Martin Island (Dr. F. Baker).

Barleeia subtenuis rimata Carpenter,1864. San Diego ,Calif. Dr. Bartsch in Proc. USNM vol.58,p.169,1920 places this in the synonymy of the typical. No one seems to have recognized it as distinct.

Barleeia coronadoensis Bartsch,1920. Off Coronado Island in 7 to 10 fms.

Barleeia dalli Bartsch,1920. Off Point Loma, Calif. in 75 fms.
Collecting data: There is a set in the San Diego Museum of Natural History from the Dr. F. Baker collection labelled as from Pt. Pinos, Monterey Co. This should probably be checked.

Barleeia bentleyi Bartsch,1920. Venice, Calif.
Collecting data: Venice, Calif. (Dr. W. Gregg); Venice,Calif. on bryozoa (Lowe and Baker) (San Diego Museum).

Barleeia oldroydi Bartsch,1920. Mink Bay, Vancouver Island, B.C. south to Coronado Islands. Type locality, Monterey, Calif.
Collecting data: Very abundant littorala at Monterey,Calif. on algae and brought up in the dredged down to perhaps 15 fms. off both Monterey and Pacific Grove; from the backs of Haliotis rufescens brought up by divers off Morro Bay, Calif.; Bird Rock, San Diego Co.; Pleistocene of Timm's Pt., San Pedro (Burch); the abundant shore form in the Monterey region. Also kelp holdfasts. (A.G. Smith);

Barleeia californica Bartsch,1920. Oakland, San Francisco Bay (M. Gordon) south to Point Abreojos, L.C. Type locality, Crocker's Wharf, San Pedro.
Collecting data: San Pedro (Lowe); (See description on p. 23).

Barleeia alderi (Carpenter),1856 . Reef Point, Orange Co. south to Tres Marias Islands. Type locality, Mazatlan, Mexico.
Se discission on p. 23.
Collecting data: Reef Point, Orange Co.; La Jolla, San Diego Co. (A.G. Smith); San Diego (T.S. Oldroyd).

Genus Anabathron Fruenfeld,1867. Reise der osterreichischen Fregatte "Novara".. Zool. vol.2-III, Moll., p. 13. Type (fide Suter,1913): Rissoa contabulata Fruenfeld. Suter gives this description: " Shell very small, oblong, thick, smooth, scalariform, with a carinated shoulder,imperforate; aperture rounded; peristome continuous."

Anabathron muriei Bartsch and Rehder, Nautilus, vol. 52, no.4, April,1939, p. 110, pl.8, figs. 2,2a. Type locality: Ogliuga I., Aleutians.
See page 34 for description.

Family Rissoidae

Genus Skeneopsis Iredale,1915. Dr. A. Myra Keen advises on this genus as follows: " Skeneopsis Iredale,1915. Proc. Malac. Soc. vol. II, p. 292 . Type (by original designation), Turbo planorbis Fabricius. This is Skenea of authors, though not of Fleming ."
" Shell orbicular, spiral, depressed and discoidal, deeply umbilicated, few-whorled; peritreme circular, continuous, entire." (H. & A. Adams.)

Skeneopsis alaskana Dall,1919. Pribilof and Unalaska Islands, Alaska. Type locality, St. Paul Island, Bering Sea.
Collecting data: Saltwater Lake, Amaknak Id., Aleutians (T.S. Oldroyd) (A.G. Smith).

Genus Amphithalamus Carpenter,1865. Type (by original designation), Amphithalamus inclusus Carpenter. Distribution, California to Japan-Panama.

" Shell minute, broadly conic to elongate ovate, smooth except for a cord or faint spiral thread on the periphery. The nucleus is large, of about 1½ whorls and is finely pitted as in Barleeia. The most striking character is a shelly bridge separating the inner lip from the open umbilicus." (Strong).

Periphery rounded, without definite marking .... lacunatus Carpenter
Periphery marked by a cord or fine spiral thread
. Periphery with a faint spiral thread
.. Shell elongate ovate .... tenuis Bartsch
.. Shell broadly ovate ....stephensae Bartsch
. Periphery with a distinct spiral cord
.. Shell elongate ovate ....trosti Strong & Hertlein
.. Shell broadly ovate ....inclusus Carpenter
(The above key from Mr. A.M. Strong's notebook).

Amphithalamus inclusus Carpenter,1865. San Pedro and Catalina Island , to the Gulf of California. Type locality, San Diego, Calif. fide Bartsch

Collecting data: No. Coronado Island (Simmons); So. Coronado Island (Lowe); Avalon Bay, Catalina Island (Strong).

Amphithalamus lacunatus Carpenter,1866. San Pedro,Calif. to San Diego. Type locality, San Pedro, Calif.

Amphithalamus tenuis Bartsch,1911. Monterey, Calif. south to Guadelupe Island, Lower Calif. Type locality, La Jolla, Calif.

Collecting data: No. Coronado Island (Simmons); also (Stephens); San Diego (Lowe); La Jolla (Stephens); Monterey Bay, shore to 10 fms.; Catalina Island, 30-70 fms.(M. Gordon); San Diego (M. Gordon).

Genus Cingula Fleming,1818. Type (by tautonymy), Rissoa cingillis (Montfort) (Turbo cingillia Montfort).

" Shell minute, white or horny; conical, pointed, many-whorled; smooth, or cancellated; aperture rounded; peristome entire, continuous; outer lip slightly expanded and thickened; operculum sub-spiral." (Woodward).

Cingula eyerdami Willett,1934. Nautilus 47:103,104, pl.8, fig.9,1934

" Shell elongate-ovate, grayish, except for the nuclear whorls, which are dirty white. Whorls rounded, appressed at the summit. Sutre strongly constricted. Base well rounded, narrowly umbilicated. Aperture rounded anteriorly, angled posteriorly. Post-nuclear whorls and base smooth to the naked eye, but under a strong lens show very faint spiral striations."

" ..The type has five whorls, and measures in millimetres: Length,2.3; diam. 1.2. Paratypes in the collection of A.M. Strong and the writer.

Range: Shuyak Strait, Afognak Island, Alaska (Eyerdam, Nautilus 57:142) to Evans Island, Pr. Wm. Sound. Type locality, Evans Island, Pr. Wm. Snd.

Collecting data: among nullipores on rocks at low tide (Eyerdam);

Cingula forresterensis Willett,1934. Nautilus 47:103,104, pl.8, 1934 Type locality, Forrester Island, Alaska and known only from type locality.

" Shell elongate-conic, white. Post-nuclear whorls appressed at the summit, moderately rounded, finely spirally striated. Last whorl elongated, with very narrow umbilical chink. Aperture rounded anteriorly, angled posteriorly."

" ... The type measured in millimeters: Length 3, diam. 1.2." This species is the most slender of west American Cingulas so far described.

Cingula martyni Dall,1886. Bering Strait to the Aleutians and eastward to Chignik Bay, Alaska (Dall). Type locality, Kyska Harbor,Aleutians.
Collecting data: Illuliuk Bay, Unalaska Island, Aleutians, dredged, (W.J. Eyerdam); Akutan Island (I. Norberg) (Eyerdam); Korovia Bay,Alaska; Elrington Island, Alaska (T.S. Oldroyd)

Cingula martyni scipio Dall,1886. Pribilof Islands to the Aleutians and eastward to Middleton Island, Alaska (Dall) Type locality, Kyska Harbor, Aleutian Islands.
Collecting data: Dutch Harbor,Aleutian Islands (W.J. Eyerdam).

Cingula alaskana Bartsch,1912. Amchitka Island, Aleutians.
Collecting data: Shuyak Strait, Afognak Island, Alaska,1924 (Eyerdam).

Cingula katherinae Bartsch,1912. Windfall Harbor, Admiralty Island, Alaska. to Queen Charlotte Ids.,B.C. (Victoria Museum) (Eyerdam).
Cingula aleutica Dall,1886. Pribiloff Islands to the Aleutians and eastward to Windfall Harbor,Admiralty Island, Alaska. (Dall). Type locality, Unalaska.
Collecting data: Shuyak Strait, Afognak Island, Alaska on bread sponges; Elrington Island, Pr. Wm. Sound, Alaska (Eyerdam); Elrington Island,Alaska (T.S. Oldroyd).

Cingula montereyensis Bartsch,1912. Moss Beach, Calif. to Monterey.
Type locality, Monterey.
Collecting data: Moss Beach (Voorhees) (Stanford Univ. Coll.); 5 to 15 fms. off Pt. Pinos (A.G. Smith).

Cingula californica (Tryon),1865. San Francisco Bay to San Pedro,Calif. Type locality, Oakland and Monterey, Calif.

Cingula orvieta Dall,1919. San Diego, Calif.

Subgenus Nodulus Monteresato,1878. Type (fide Cossmann), Rissoa contorta Jeffreys.

" In Nodulus we find a very characteristic oblique aperture; axial ribs are never present and spiral sculpture, if at all present, is reduced to exceedingly fine striations." (Bartsch,1911).

* Two references for this group are: Bartsch, Paul " The West American Mollusks of the Genus Cingula", Proc. U.S.N.M., no. 1871, vol.41, pp 485-488, pl.41,1912, and Bartsch, Paul " The West American Mollusks of the Genus Nodulus", Proc. U.S.N.M. no. 1858, vol.41, pp. 289-291, 1911.

Bartsch in his 1911 paper considered Nodulus a genus, but Dall in Bull. 112 followed by Mrs. Oldroyd and others have used it as a subgenus. The differences seem to be slight, and until further advised we propose to use it as a subgenus.

However, Mr. A.M. Strong comments on it as follows " The shells as figured and described by Bartsch are slender or subcylindrical while the shells of Cingula are ovate to subglobose. All the known species of Nodulus are Alaskan with one exception. I think it would be well to follow Bartsch. However, it seems out of place to put the shallow water southern species in the same genus with the Alaskan species."

to Shuyak Strait (Eyerdam).
Cingula cerinella Dall,1886. Kyska and Amchitka/Islands, Alaska, and Atka Id. Type locality, Atka Island, Alaska.
Collecting data: Shuyak Strait, Afognak Island, Alaska, 1924, on nullipores- Extended Range about 1500 miles eastward from Atka Island (W.J. Eyerdam);

Cingula asser Bartsch,1910. Atka Island, Aleutians to Cook's Inlet.
Type locality, Port Graham, Alaska.

Cingula kelseyi Bartsch,1911. San Diego south to Pt. Abreojos (Jordan).
Type locality, Coronado Island, San Diego, Calif.

Collecting data: San Diego (Lowe Collection); Pt. Abreojos,L.C. (T.S. Oldroyd) (A.G. Smith).

Cingula kyskensis Bartsch,1911. Kyska and Atka Islands, Aleutians to Shuyak *Strait, Afognak Island*,Alaska on nullipores (Eyerdam). Type locality, Kyska Harbor, Aleutians.

Collecting data: Mr. Eyerdam's record above is an extended range of about 1600 miles eastward from Kyska Island.

Cingula palmeri Dall,1919. Pribilof Islands, Bering Sea.
Type locality: St. Paul Island, Bering Sea.

Genus *Alvania* (Leach) Risso,1826. Type (by subsequent designation, M. Gordon, *Nautilus* 53:29,1939), *Alvania freminvillea Risso* = *Turbo cimex* Linnaeus.

This genus has been revised by a number of different authors. A few of the papers follow:

Gordon, McKenzie Jr., Nautilus 53:29,33 " A New Subgenus and Species of West Coast Alvania." 1939.

Bartsch, Paul, " The Recent and fossil mollusks of the genus Alvania from the west coast of America.", Proc. U.S.N.M. vol.41, pp. 333-362, pls. 29-32.

In this paper Dr. Bartsch gives a key to species. Mr. A.M. Strong's key will follow this discussion.

" Shell oval, turbiniform; spire short, apex sharp; whorls rounded, usually cancellated; aperture subcircular, crenulated within; outer lip with a marginal exterior varix." (Tryon).

However, Mr. Gordon in his paper cited above makes the following statements

" The true Alvanias of the Mediterranean region differ from our West Coast forms in the following particulars:

(1) They have heavy thick shells about 5 mm. in height while the latter have rather delicate shells generally less than 3 mm. in height.

(2) They possess five postnuclear whorls while our West Coast forms generally average three.

(3). The outer lip of the former is greatly thickened by a prominent buttress-like varix and its interior bears prominent denticles, while the West Coast forms have a thin to slightly thickened outer lip with the interior generally smooth but occasionally with shallow spiral lirations.

(4) The sculpture of the shells of true *Alvania* is also coarser and heavier than that of the West Coast species.

Subgenus *Willettia* Gordon,1939. Nautilus 53:31 Type (by original designation), *Alvania montereyensis* Bartsch,1911.

" This subgenus is characterized principally by a turbinate, well-rounded nucleus of approximately two whorls which is sculptured by spiral lirations. The shell is not thick and generally less than 3 mm. in height. The post-nuclear whorls are generally three in number and somewhat inflated or well rounded. The shell is sculptured by spiral cords on the whorls and base and axial ribs on the whorls. The intersection of the ribs and cords form nodes. The aperture is rissoid with the outer lip thin to slightly thickened and smooth within. The peritreme is complete."

* See Page 30 for the continuation of this discussion.*

Cingula martyni Dall,1886. Bering Strait to the Aleutians and eastward to Chignik Bay, Alaska (Dall). Type locality, Kyska Harbor,Aleutians.

Collecting data: Illuliuk Bay, Unalaska Island, Aleutians, dredged, (W.J. Eyerdam); Akutan Island (I. Norberg) (Eyerdam); Korovia Bay,Alaska; Elrington Island, Alaska (T.S. Oldroyd)

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Collecting data: Dutch Harbor,Aleutian Islands (W.J. Eyerdam).

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Collecting data: Shuyak Strait, Afognak Island, Alaska,1924 (Eyerdam).

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Cingula aleutica Dall,1886. Pribiloff Islands to the Aleutians and eastward to Windfall Harbor,Admiralty Island, Alaska. (Dall). Type locality, Unalaska.

Collecting data: Shuyak Strait, Afognak Island, Alaska on bread sponges; Elrington Island, Pr. Wm. Sound, Alaska (Eyerdam); Elrington Island,Alaska (T.S. Oldroyd).

Cingula montereyensis Bartsch,1912. Moss Beach, Calif. to Monterey. Type locality, Monterey.

Collecting data: Moss Beach (Voorhees) (Stanford Univ. Coll.); 5 to 15 fms. off Pt. Pinos (A.G. Smith).

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However, Mr. A.M. Strong comments on it as follows " The shells as figured and described by Bartsch are slender or subcylindrical while the shells of *Cingula* are ovate to subglobose. All the known species of *Nodulus* are Alaskan with one exception. I think it would be well to follow Bartsch. However, it seems out of place to put the shallow water southern species in the same genus with the Alaskan species."

to Shuyak Strait (Eyerdam).

Cingula cerinella Dall,1886. Kyska and Amchitka/Islands, Alaska, and Atka Id. Type locality, Atka Island, Alaska.

Collecting data: Shuyak Strait, Afognak Island, Alaska, 1924, on nullipor-es- Extended Range about 1500 miles eastward from Atka Island (.J. Eyerdam);

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(3). The outer lip of the former is greatly thickened by a prominent buttress-like varix and its interior bears prominent denticles, while the West Coast forms have a thin to slightly thickened outer lip with the interior generally smooth but occasionally with shallow spiral lirations.
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* See Page 30 for the continuation of this discussion.*

Genus Alvania (Leach) Risso,1826.

The following key is from Mr. A.M. Strong's notebook.

Spiral sculpture distinctly stronger than the axial
. Spiral sculpture of incised lines San Bartolome Bay .. bartolomensis
. Spiral sculpture of raised cords
.. Axial sculpture of threads between the cords Cape San Lucas. albolirata
.. Axial sculpture of broad,subobsolete ribs Gulf of Calif.... lirata
Spiral sculpture not distinctly stronger than the axial
. Junction of the axial ribs and spiral cords nodulose
.. Sutures channeled
... Spiral cords on penultimate whorl 2
.... Basal cords 3 Lower Calif. .... cosmia Bartsch
.... Basal cords 4 Lower Calif. .... purpurea Dall
... Spiral cords on penultimate whorl more than 2
.... Spiral cords on penultimate whorl 3
..... Cords equal in strength Galapagos .... halia Bartsch
..... Cord at summit weaker Galapagos .... ima Bartsch
.... Spiral cords on penultimate whorl more than 3
..... All spiral cords equal
...... Axial ribs strongly protractive Clarion Island ... clarionensis
...... Axial ribs nearly vertical Tres Marias Islands.. granti Strong
..... Spiral cords unequal
...... Nodes compressed, sharp edged Galapagos .... lara Bartsch
...... Nodes rounded Panama ....valerionia
.. Sutures not channeled
... Shell elongate conic
.... Nodes cusp like Gulf of Calif. ....effusa
.... Nodes rounded, not cusp like
..... Axial ribs on penultimate whorl 16-18
...... Whorls slopingly shouldered Lower Calif. ..... aequisculpta
...... Whorls not shouldered Cape San Lucas .... herrerao
..... Axial ribs on penultimate whorl 20 or more
...... Whorls slopingly shouldered Cape San Lucas ..... gallegosi lucasana
...... Whorls not shouldered Cape San Lucas ....gallegosi
... Shell ovate or subglobose
.... Shell strongly umbilicated Lower Calif. ....oldroydae
.... Shell narrowly umbilicated or imperforated
..... Base with 2 spiral cords Gulf of Calif. .... tumida
..... Base with 4 spiral cords Gulf of Calif. .....monserratensis
Spiral sculpture not distinctly stronger than the axial
. Junction of spiral cords and axial ribs not nodulous
.. Sutures strongly channeled Gulf of Calif. .... excurvata
.. Sutures not channeled
... Spiral sculpture on penultimate whorl less than 10
.... Shell elongate conic Cape San Lucas .... electrina
.... Shell ovate
..... Base with 4 spiral cords Central America ......perlata Morch
..... Base with more than 4 spiral cords
...... Axial ribs on penultimate whorl 14 Galapagos .... nemo Bartsch
...... Axial ribs on penultimate whorl 20 Galapagos .... galapagensis
... Spiral cords on penultimate whorl 10 or more
.... Shell elongate conic Galapagos ....hoodensis
.... Shell ovate
..... Axial ribs on penultimate whorl 32 Galapagos ... profundicola

Genus Alvania Risso,1826 Type, Rissoa abyssicola Forbes

" Shell small, broadly ovate to elongate conic, sculpture with spiral cords or axial ribs or both. Aperture subcircular, without notch or canal, outer lip in the adult thickened externally, usually with a raised varix. Umbilicus closed, body with a strong callus." (Strong).

Alvania carpenteri Weinkauff,1885.	Forrester Island to Lower Calif.	
Alvania purpurea Dall,1872.	Monterey to San Martin Island	
Alvania acutilirata Carpenter,1866.	Monterey to San Martin Island	
Alvania aequisculpta Keep,1887.	Catalina to Todos Santos Bay	
Alvania cosmia Bartsch,1912.	San Pedro to San Martin Island	
Alvania oldroydae Bartsch,1912.	San Pedro to Guadalupe Island	
Alvania almo Bartsch,1912.	Santa Barbara Island to Reef Point	
Alvania rosana Bartsch,1912.	Santa Rosa and Catalina Islands	
Alvania bartolomensis Bartsch,1917.	San Bartolome Bay	
Alvania albolirata Carpenter,1864	Cape San Lucas	
Alvania electrina Carpenter,1864	Cape San Lucas	
Alvania tumida Carpenter,1856	Cape San Lucas	
Alvania lucasana B. H. and S.,1930	Cape San Lucas	
Alvania contrersi Jordan	Pleistocene , Magdalena Bay	
Alvania keenae Gordon	Moss Beach	
Alvania herrerae B. H. and S.,1930	Cape San Lucas	
Alvania gallegosi B. H. and S.,1930	Cape San Lucas	
Alvania monserratensis B. H. and S.,1930	Gulf of Calif.	
Alvania effusa Carpenter,1856	Gulf of Calif.	
Alvania lirata Carpenter,1856	Gulf of Calif.	
Alvania excurvata Carpenter,1856	Gulf of Calif.	
Alvania clarionensis Bartsch,1912.	Clarion Island	
Alvania perlata Morch,1868	Central America	
Alvania granti Strong	Tres Marias Islands	
Alvania profundicola Bartsch,1912.	Galapagos	
Alvania hoodensis Bartsch,1912	Galapagos	
Alvania galapagensis Bartsch,1912.	Galapagos	
Alvania nemo Bartsch,1912	Galapagos	
Alvania halia Bartsch,1912.	Galapagos	
Alvania ima Bartsch,1912	Galapagos	
Alvania lara Bartsch	Galapagos	
Alvania peruviana BDrtOrchigny	Peru	
Alvania valeronis Strong and Hertlein	Panama	
Alvania bicolor Bartsch	Galapagos	(MS?)
Alvania duncani Bartsch	Galapagos	(MS?)

* Continued from bottom of Page 28*

Alvania keenae Gordon,1939. Nautilus 53:31,32, pl.7, figs. 7,9 (left). Type locality, Moss Beach, San Mateo Co., Calif. and apparently known only from the type locality.

" Shell small, elongate-ovate, yellowish-white. Nuclear whorls one and one half, turbinate, with axis parallel to that of the post-nuclear turns; first nuclear half-turn smooth (eroded?); last turn sculptured by approximately ten rounded, hardly elevated, somewhat beaded spiral lirae, separated by v very narrow spiral grooves. Post nuclear whorls well rounded, almost inflated, marked by narrow, rounded, elevated, slightly protractive axial ribs, about one third to one fourth as wide as the spaces that separate them. Of these, 18 occur on the first, 22 on the second, and 25 on the third (last) turn.

(con.)

The axial ribs are corssed by prominent, elevated, well rounded spiral cords which are stronger than the axial ribs; separated by slightly wider, broadly rounded spiral grooves. There are five spiral cords on the first two whorls and six on the last, the extra cord being added below the periphery by the coiling of the shell. The two posterior cords are narrower and more closely spaced than the rest which are subequal in strength and spacing. This results in a slight angulation at the third cord in the second whorl, but not in the last whorl where the second cord becomes slightly stronger. The axial ribs are strongest where they cross the spiral cords, forming prominent eliptical nodes with the long axis parallel to the spiral cords. The axial ribs are not well developed on the last half-turn. The sutures are rather strongly constricted.

Periphery well rounded, marked by a sulcus not quite as wide as that separating the heavier cords on the spire. Base rounded, narrowly umbilicated, with a slight angulation marking the boundary of the umbilical area. The base is sculptured by six (not counting the first sub-peripheral cord which is exposed on the last whorl) low, rounded, closely-spaced spiral cords, much weaker than those on the spire; the last one occupying the umbilical area. The base is also marked by faint lines and constrictions of growth. Aperture oval; posterior angle obtuse; outer lip very slightly thickened, well-rounded; inner lip rounded, slightly reflexed and appressed to the base posteriorly; parietal wall covered with a moderately thick callus which renders the peritreme complete. The type posses three and one quarter whorls and measures: length,1.9; diameter,1.0. "

Holotype: No. 6516 (Stanford Univ. type coll.).

Alvania keenae appears to be most closely related to A. montereyensis Bartsch which possesses eight spiral threads on the nuclear whorls and has similar sculpture. The new species, however, differs from A. montereyensis in having more spiral cords on all the wharls, less axial ribs in the early whorls, and weaker spiral cords on the base, besides a more robust shape."

Alvania montereyensis Bartsch,1911. Sitka,Alaska south to Cayucos (Strong). Type locality, Monterey, Calif.

Collecting data: Monterey Bay and vicinity, low tide under rocks; 11 mi. N. of Ft. Bragg ; 3 miles south of Cayucos (A.G. Smith); Cayucos (Lowe)

Alvania microglypta Haas,1943. Zoological Series of Field Museum of Natural History, vol. 29, no.1, pp. 2-4, fig.1. Type locality, Point Pinos, Monterey Peninsula, Calif. washed from sand in a tide pool. Known only from the type locality.

" Shell elongate, conic, creamy white, solid, minute, with four and one-half rather rapidly increasing whorls. Nuclear whorls about one and one half, voluminous, globular, smooth (fig.1,c), with the apex sunk below the level of the last half. Post-nuclear whorls three, spirally keeled, separated by a distinct, though by no means very deeep suture. Three rather obtuse keels are present on the first post-nuclear whorl, which become more defined on the second whorl, and which assume almost fantastic features on the last post-nuclear whorl, where nodular excressenses are developing on them and where secondary keels intercalate between the original ones or originate below the lowest one. The whorls are rather slender, not swollen, distinctly shouldered, the upper keel forming the angle of the shoulder. Down to the first post-nuclear whorl there is no trace of axial sculpture, but, starting on the second, axial grooves are seen which regularly intersect the space between the suture and the upper keel, carving this into two ridges and furrows of about equal length; the furrows correspond to the axial grooves of the apace above

(con.)

the keel. The middle and the lower keels on the second postnuclear whorl show only indistinct traces of such crossing of an axial sculpture. Finally, on the last post-nuclear whorl, the cutting of the keels into knobs is not traceable to axial sculpture, but has become quite irregular; while the marginal knobs of the middle and the lowe keels are moderately small and homogeneous, those on the upper keel- by far the thickest of the three- are irregular as to shape and size (fig. 1,a,b). In an alagous way the space between the upper keel and the suture is irregularly beset with nodules, the furrows between which correspond to those dividing the knobs of the upper keel. The aperture is oval, doubly liped, showing the external spiral sculpture weakly within; the inner lip is thin, smooth, much appressed, and the outer one is thicker, showing the keels at its outer margin. No umbilical chink is discernable. Base of the shell rather flat, smooth and shiny." Measurements.- Height 0.97 mm., width 0.6 mm., height of aperture 0.41 mm.
Diagnosis- A very minute species of the rissoid genus *Alvania* , subgenus *Willettia,* characterized by its extreme smallness, by *a wide, subglobular nucleus of* one and one half whorls, by a solid shell strongly spirally keeled and by having only the slightest indications of intersecting axial sculpture.
Comparisons- The new form cannot be easily compared to any other known species, since it combines features thought to be characteristic of the subgenus *Willettia* with features to be found in other West Coast species, e.g. in *A. bakeri Bartsch*; these points will be discussed below.

Alvania sanjuanensis Bartsch,1920. Drier Bay, Knight Island, Pr. Wm. Sound, *Alaska,1923 (Eyerdam)* south to San Juan Islands, Gulf of Georgia.
Type locality, San Juan Islands, Gulf of Georgia.
Collecting data: Mr. Eyerdam's record listed above is an extension of the range northward some 1500 miles; Washington (Lowe Coll.); Seattle (Gordon)

Alvania aequisculpta Keep,1887. Pacific Grove, Monterey Bay (A.G. Smith) *south to Cape San Lucas*, Lower Calif. Type locality, San Diego, Calif.
Collecting data: Dredged off Redondo Beach, Calif. in 25 fms. gravel; El Morro Point, north of Ensenada,L.C.; Punta Banda on Todos Santos Bay,L.C.; Arbolitos,L.C.; White's Point,L.A. Co.; dredged off Monterey Bay in 15 fms. (Burch); Catalina Island in 30 to 70 fms.(Gordon); San Diego (T.S. Oldroyd); beach drift at Pacific Grove (A.G. Smith); Avalon, shore and from 5 mi. S. of Laguna (A.G. Smith); San Pedro (Baldridge); Todos Santos Bay (Hemphill); Pacific Beach (Kelseyand Stephens); San Diego (Baker and Kelsey); La Jolla (Chaney) (San Diego Museum).

Alvania cosmia Bartsch,1911. Santa Barbara Islands south to San Martin *Island, L.C.* Type locality, San Pedro, Calif.
Collecting data: San Martin Island, L.C. (Dr. F. Baker); So. Coronado Is. (Baker); Pt. Vincent, L.A. Co. (Strong); La Jolla (Chaney); San Pedro (Lowe); Reef Pt.,Orange Co. in 12 fms. (T.S. Oldroyd); San Diego (T.S. Oldroyd); 5 mi. S. of Laguna Beach and also White's Point, L.A. Co. (A.G. Smith).

Alvania kyskaensis Bartsch,1917. Kyska Harbor, Aleutians.

Gordon stated that in addition to the above *A. halia* and *A. nemo* Bartsch from the Galapagos are in the subgenus *Willettia.* The remaining species are questionably *Alvania s.s.* Therefore, we will simply list them without attempt at subgeneric *classification*.

Alvania castanella Dall,1886. Kyska to Atka Island, Aleutians.
Type locality, Atka Island, Alaska.

Alvania dalli Bartsch,1927. Proc. U.S.N.M., vol.70, p.30, pl.3, fig.6,1927. Type locality, Shuyak Strait, Afognak Island, Alaska.

Collecting data: Collected from type locality by W.J. Eyerdam on nullipores.

Alvania aurivillii Dall,1886. Kyska to Adakh Island, Aleutians. Type locality, Adakh Island, Alaska.

Alvania bakeri Bartsch,1910. Port Graham, Cook's Inlet, Alaska.

Alvania trachisma Bartsch,1911. Monterey, Calif.

Alvania californica Bartsch,1911. Mendocino Co., Calif. (A.G. Smith) south to Redondo Beach, Calif. (Burch). Type locality, Monterey.

Collecting data: Dredged off Redondo Beach, Calif. in 25 fms. gravel. (Burch); have not collected this at Monterey; one set *cf. californica* from Russian Gulch, Mendocino Co., Calif. (A.G. Smith).

Alvania carpenteri Weinkauff,1885. (New name for *A. reticulata* Carpenter, preoccupied). Drier Bay, Knight Island, Prince Wm. Sound, Alaska (Eyerdam) to Monterey, Calif. Type locality, Neah Bay, Wash.

Collecting data: Mr. Eyerdams record extended the range northward from Forrester Island, Alaska. ; Monterey, Calif. (Oldroyd) (San Diego Museum of Natural History.) ; Puget Sound (T.S. Oldroyd); Elrington Island(Oldroyd).

Alvania pedroana Bartsch,1911. Redondo Beach (Burch) to Mission Bay. Described from the Pleistocene of San Pedro, Calif. and questionably Recent. However, I have a set labelled *cf. pedroana* which must be close to it, but dredged from over 100 fathoms off Redondo Beach on mud bottom. (Burch). a set so identified in the San Diego Museum of Natural History from Mission Bay collected by Stephens.

Alvania filosa Carpenter,1865. Vancouver Island, B.C. (Taylor) and Neah Bay, Wash. north to Hoonah, Alaska (Mrs. Kate Stephens). Type locality, Neah Bay.

Collecting data: Mrs. Stephens set extending the range northward to Alaska is in the San Diego Museum of Natural History.

Alvania alaskana Dall,1886. Nunivak Island, Bering Sea to Shuyak Strait, Afognak Island, Alaska (Eyerdam). Type locality, Nunivak Island.

Collecting data: Elrington Island (T.S. Oldroyd); Windfall Harbor, Alaska (T.S. Oldroyd).

Alvania rosana Bartsch,1911. Monterey Bay (Gordon) south to Catalina Island Calif. Type locality, off Santa Rosa Island, Calif.

Collecting data: Dredged in 25 fms. off Avalon, Catalina Island; off Redondo Beach, Calif. in 25 fms. gravel and also in 75 fms. rock and gravel. (Burch); Catalina Island in 35 fms. (Lowe); Catalina Island in 30 fms. (Baker); Carmel Bay in 25 fms. (C.A.S.); common with *A. acutelirata* off Catalina (C.A.S.); Catalina in 30 fms. (T.S. Oldroyd) (A.G. Smith).

Alvania iliuliukensis Bartsch,1911. Iliuliuk Harbor,Unalaska to Belkoffski, Alaska. Type locality: off Iliuliuk Harbor, Alaska.

Alvania dinora Bartsch,1917. Forrester Island, Alaska.

Alvania compacta Carpenter,1864. Port Etches, Alaska to San Diego, Calif. Type locality: Vancouver Island, B.C.

Collecting data: Dredged off Monterey, Calif. in 15 fms.; off Redondo Beach, Calif. in 25 fms. gravel; Pleistocene of Hilltop Quarry, San Pedro, (Burch); off Friday Harbor, Puget Sound (T. Kincaid); Drier Bay, Knight Island, Alaska in 1923 (W.J. Eyerdam); Crescent City,Calif. (Chace); Washington (Lowe); Windfall Harbor, Alaska (Mrs. Kate Stephens); Monterey Bay in 15 fms. (Gordon); Puget Sound and Olga, Puget Sound, also Trinidad, Calif. (T.S. Oldroyd).

Alvania acutelirata Carpenter,1866. Monterey, Calif. south to San Martin Island, L.C. Type locality, San Diego. Type at U.C. The original spelling was with an "e" instead of an "i" as usually spelled.

Collecting data: Dredged off Redondo Beach, Calif. in 25 fms. and also to 100 fms.; from backs of Haliotis rufescens brought up from about 35 ft. off Morro Bay; Cayucos,Calif. littoral; Pleistocene of Timm's Piint,San Pedro (Burch); dredged off S. Coronado Id. in 18 fms. (Dr. F. Baker); San Diego (Lowe); Monterey Bay in 5 to 30 fms., also San Diego (T.S. Oldroyd); 3 mi N. of Cayucos (A.G. Smith).

Alvania purpurea Dall,1871. Monterey south to San Martin Island, L.C. Type locality, Monterey.

Collecting data: Monterey, Calif. from algae close to shore; dredged off Monterey in 15 fms.; Punta Banda, on Todos Santos Bay, littoral; (Burch); dredged off S. Coronado Island in 18 fms. (Dr. F. Baker); San Diego, Calif. (T.S. Oldroyd); La Jolla (Chaney); Monterey Bay on rocks at low tide to 30 fms.; Reef Point, Orange Co. (A.G. Smith).

Alvania almo Bartsch,1911. Santa Barbara Island, Calif. to Orange Co.

Collecting data: Reef Point in 10 fms. (Strong).

Alvania oldroydae Bartsch,1911. Monterey Bay, Calif. (Gordon) south to Guadalupe and San Martin Islands, L.C. Type locality, Sam Pedro

Collecting data: White's Point, L.A. Co. (E.V. Edmonds); dredged off S. Coronado Island (Dr. F. Baker); La Jolla (Chaney); Ocean Beach (Simmons); beach drift at Pacific Grove (Gordon); Reef Point (Orange Co.; A.G. Smith).

Alvania burrardensis Bartsch,1921. Proc. Biol. Soc. Wash. 34:38. Type locality, Burred Inlet, British Columbia. Known only from type locality.

Additions and Corrections

Continued- from page 25 this issue- original description of Anabathron muriel Bartsch and Rehder,1939. Nautilus 52:110,111,1939, pl.8, fig. 2,2a.

" Shell very minute, elongate conic, thin, semi-translucent, white. The nucleus consists of a single, somewhat inflated, well rounded turn which is slightly obliquely placed. The 2.75 postnuclear whorls bear a strong spiral keel on the middle of the turns. There is a second keel on the middle of the base and a third that bounds the edge of the funnel-shaped umbilicus. In addition to this, the entire surface of the shell is marked by very fine spiral lirations and axial incremental threads, which show as a fine reticulation when seen under high magnification. The umbilicus is broadly expanded and marked by incremental lines and the fine spiral lirations mentioned for the spire. Aperture broadly oval, almost subcircular; peristome slightly thickened. The last whorl is slightly solute."

The type, USNM no. 535345, was obtained from the droppings of a sea otter at Ogliuga Id.,Aleutian Ids. It measures: Length 0.8 mm,diam.0.4 mm.

Additions and Corrections

Mr. Henry Dodge, 6 Rochambeau Road, Scarsdale, N.Y.

I notice in the last Minutes that Dr. Keen cites *Murex argus* Linne as the type, by original designation, of *Argobuccinum* Klein in Hermannsen 1846. *Argus*, as a specific name, was only used once by Linnaeus and that was for his *Cypraea argus*. Grant and Gale make the same error. I immagine that Hermannsen must have designated *Murex argus* Gmelin (for a long time placed in *Ranella* or *Bursa*) although Hermannsen's work is not available here. I will check it when I next go to Boston or Washington. At any rate *Murex argus* is not Linne, but Gmelin. Possibly the error started as far back as Hermannsen.

I have been spending some time on a catalogue of the Linnean species and their present-day representatives and have come across many errors where species of later authors are improperly attributed to Linnaeus. Some of them are Lamarck's species and here the trouble was caused by transcribing a handwritten " Lam." into " Linn.". I have caught myself doing the same thing myself, as my handwriting is extremely bad. Others are Gmelin's species and there the mistake possibly arose because Gmelin's work was published as the 13th. Edition of the *Systema Naturae*, and, for some utterly ridiculous reason writers felt that his species, unknown to Linnaeus, must be given as " Linne". It is possible that Hermannsen made this mistake. I will be interested to check back.

Your Minutes continue to improve in interest and scholarship, and you are doing a grand, workmanlike job, and deserve a lot of credit. I have not been much interested in western Pacific species as I should be as I have been confining myself to Linnaean shells lately, and they are pretty infrequent in your part of the world. However, I am still planning to come to California soon and when I do I hope to learn something about them..."

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Southward Extension of Range of *Pediculariella californica* (Newcomb).

A short time ago we were sent a fine set of the above species by Mr. and Mrs. E.W. Cameron, Box 644, San Pedro, Calif. They were collected by Mr. H. Jacobs, a friend of theirs who is a deep sea diver. This is an extension of range southward from Monterey and a correction of our data as published in Minutes #53, page 25.

We are indebted to Dr. Fritz Haas of the Chicago Natural History Museum who obviously received some of the same lot, for the overlooked generic name, *Pediculariella* Thiele, 1925. The letter from Dr. Haas follows.

" I want to communicate to you some facts concerning a not too common Californian shell which only last week came into our Museum's possession.

We were presented with a rather fine specimen of what is generally called the coral, but what really is a *Hydrocoralline*, a beautifully pink specimen of *Millepora*. Among the rather interesting animal association to be found on this *Millepora*, there were about a dozen shells of what in the " Minutes", No. 53, p.25 were called *Pedicularia californica* Newcomb. The longest specimen was 10,25 mm. and all of them were rather of variable shape, according to the place where they had settled on the *Millepora*. Those sitting on the flat side of the stems were much broader than those attached to the rather narrow edges. Their color was in general way exactly that of the *Millepora*, only occasionally interrupted by a white belt at the circumference. The exact data accompanying the find are: 2 miles off the west side of Catalina Island, 150 feet deep.

I thought that this information might interest you or any member of your conchological club, whose Minutes always give me the highest pleasure.

I want to call your attention, by the way, to the fact that Thiele, in 1925 had separated *Pedicularia californica* from typical *Pedicularia* on account of obvious differences in the mouth parts, and that he erected for it the new genus *Pediculariella*, and that Schilder (Fossilium Catalogus, Pt. 55,1932) adopted this name."

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It is of furthwr interest to mention that the diver mentioned in the above article has also produced numbers of other exceedingly rare and beautiful shells. Mr. Jacobs has obtained a number of perfect living specimens of Tegula regina (Stearns),1892. This beautiful species is of almost legendary rarity.

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The following collecting data was received from Mr. W.J. Eyerdam after we had typed the report. These records will supplement those published in Minutes #54 as well as the first part of this issue.

Bittium eschrichtii Middendorff,1849.- Port Orchard,Kitsap Co.; Alki Point, Seattle, King Co.; Port Ludlow, Jefferson Co. and many other localities on Puget Sound, Wash. also Drier Bay, Knight Island, Alaska. Extension of geographic range northward from Sitka.

Bittium (Semibittium) vancouverensis Dall and Bartsch,1910 . Ishut Bay, Afognak Island, Alaska,1945- on bread sponges under rocks- always scarce- Extension of geographic range northward from Barklay Sound, Vancouver Id.

Bittium (Lirobittium) munitum Carpenter,1864. Victoria, B.C.

Trichotropsis bicarinata Sowerby,1825. St. Lawrence Island, Bering Sea.

Trichotropsis costellata Couthouy,1839. Trichotropsis borealis Sowerby,1829 . Drier Bay, Knight Island,1923; Izhut Bay, Afognak Island,1922; Red Fox Bay, Shuyak Strait,1924; Sitkalidak Id.,1931; Dutch Harbor, Aleutian Islands,1932; and Raspberry Id., Alaska,1945; (Eyerdam); Hinchinbrook Id., Pr. Wm. Snd., Alaska (I. Norberg).

Trichotropsis cancellata Hinds,1843. Strait of Juande Fuca,Wash.; Izhut Bay, Afognak Id.,; Drier Bay, Knight Island,; and Sitkalidak Id.,Alaska- dredged.

Trichotropsis insignis Middendorff,1849. Izhut Bay, Afognak Island; Sitkalidak Id.,Alaska; and Dutch Harbor, Aleutian Islands under stones.

Micranellum oregonense Bartsch,1922. Drier Bay, Knight Id., Pr. Wm. Spund, Alaska- dredged.

Fartulum occidentale Bartsch,1920. Under stones at low tide- Drier Bay, Knight Island. Extension of geologic range northward from Gulf of Georgia about 2,000 miles.

Bivonia compacta Carpenter,1864. Rosario Beach, Skagit Co., Wash.

Aletes centiquadratus Valenciennes,1846. Corinto,Nicaragua,1939.

Tachyrhynchus erosus Couthouy,1833. Smith's Cove, Seattle, Wash. in 10 fms.

Tachyrhynchus erosus major Dall,1919. Drier Bay, Knight Island, and Izhut Bay, Afognak Island, Alaska- dredged.

Tachyrhynchus lacteolus Carpenter,1865. Drier Bay, Knight Island- dredged.

Littorina squalida Broderip & Sowerby,1829. Petropavlovsk, Avatcha Bay, Kamchatka, on rocks at extreme low tide- occurs in isolated small colonies- a large heavy coarse shelled species about the size of Littorina littorea L.

Littorina sitchana Philippi,1846. Many colonies on Puget Sound and Wash. co coast; also Drier Bay, Knight Id.,; Izhut Bay, Sfognak Id.; Sitkalidak id; Kodiak Id.; Raspberry Id.; King Cove, Alaska peninsula; Unimak Id; Dutch Harbor; Unalaska Id.; Atka Id., Alaska and Aleutian Islands; also Vladivostock,Siberia 1928 and Tsuruga,Japan,1930. This is a very common and variable species. There are a number of forms and banded or color varieties which, however, need not be named. It is possible that the Vladivostock shells could be a good subspecies.

Littorina atkana Dall,1886. This seems to be a rather rare species. I found only two specimens on Atka Island, the type locality, and none on any of the other Aleutian Islands visited.

Littorina aleutica Dall,1873. Atka Island- rare.

Littorina groenlandica Menke,1830. Godthaab,Greenland, the type locality.

(con.)

Littorina rudis Donovan,1800. Port Orchard, Kitsap Co. and Rosario Beach, Skagit Co., Wash.; Drier Bay, Izhut Bay, Sitkalidak Id., and all Aleutians visited; also Gulf of Kronotski, Kamchatka,1925 and Port Arthur, Manchuria, 1928- also in exchange from New England,England,France,Sweeden,Norway,White Sea, and Russia.

Littorina planaxis Philippi,1847. Port Orchard, Kitsap Co., and Alki Pt. Seattle, Wash.- not common in this area.

Littorina (Melarhaphe) scutulata Gould,1869. Nearly everywhere on rocks near high tide mark in Puget Sound. Izhut Baym Afognak Id., Drier Bay, Knight Id., Raspberry Id., Alaska. Does not seem to be common in Alaska. * Note* The specimens that I have collected this summer on Raspberry Strait, Raspberry Island are mostly black, and without the mottled patterns of the Puget Sound shells. They are also more slender and are not common. This one perhaps merits a subspecific name.

Lacuna porrecta Carpenter,1864. Port Orchard, Kitsap Co., Alki Pt., Seattle and Rosario Beach, Skagit Co., Wash. on eel grass.

Lacuna divaricata Fabricius,1780. Drier Bay,Mallard Bay and Thum Bay, Knight Island, Three Saints Bay, Kodiak Id., Izhut Bay, Afognak Id., and Raspberry Id., Alaska- on eel grass.

Lacuna carinata Gould- This is the name given to about ten lots of Alaskan shells submitted to Dr. S.S. Berry for identification about 4 years ago under the name Lacuna divaricata. Which name is correct? * L. carinata*

Lacuna variegata Carpenter,1864- Puget Sound.

Lacuna solidula Loven,1846. In a shallow lagoon- Red Fox Bay, Shuyak Strait, Afognak Island- on Fucus in countless thousands, 1931.

New Publications

Schenck, Hubert G. and Keen, A. Myra " Biometrical Analysis of Molluscan Assemblages", Societe De Biogeographie- Contribution A L'Etude de la Repartition Actuelle Et Passee Des Organismes dans La Zone Neritique, Paris, 1940- 14 pages and 2 plates.

Schenck,Hubert G.- " Geologic Application of Biometrical Analysis of Molluscan Assemblages", Journal of Paleontology, vol. 19, no.5, September, 1945. 20 pages 2 plates.

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William G. Fargo , 506 Union St.,Jackson, Michigan is again spending the winter at his Florida address, P.O. Box 874, Pass-a-Grille.

Leslie Hubricht, 63 Longfellow St., Detroit 2, Michigan. This is his new address.

Marshall Sohl Jr., 1433 W. 134th St., Gardena, Calif. We are happy to welcome Mr. Sohl as one of our subscribers and sincerely hope that he will be able to attend some of the meetings.

Captain C.M. Dumbauld, (MC), USN, Medical Officer in Command, U.S. Naval Hospital, Balboa, Canal Zone. " I recently saw a copy of the Minutes of the Conchological Club of Southern California in the office of Dr. James Zetek. I wonder if it would be possible for me to be placed on the mailing list for this pamphlet. Could you also tell me if back issues are available and how obtained." We will be happy to mail Captain Dumbauld all available back issues of our paper.

Mrs. W.V. Hadfield, Private Bag, Takaka, New Zealand. " I have posted you a small parcel of shells, some of which I hope will prove new to you. We cannot send money out of the country, so I hope you will accept this as some slight token of appreciation of your kindness in sending me your club notes. These have been coming regularly and have been much enjoyed. " Thank you- and the editor should add that he has received many fine and rare shells through exchange with Mrs. Hadfield and had perhaps belatedly here mention receipt of a nice box early in the war.

Minutes of the Conchological Club of Southern California- Dec. meeting

The Conchological Club of Southern California met at their new location in the Junior Museum Lecture room, which is located on the ground floor in the S.E. corner of the Junior Museum Building.

The meeting was held Tuesday evening, Dec. 4, 1945, and was called to order by the president, Dr. W.O. Gregg. It being a rainy night but eleven members were present.

Due to the fact that New Year's day falls on the regular meeting day in January, it was voted , that for that occasion only, the meeting be held one weel later, Jan. 8,1946.

There were no reports by standing committees. The minutes of the previous meeting were approved.

Due to the fact that there had been no regular meeting in November, the president appointed as Nominating Committee for next year's officers, the following: E.P. Chace, Dr. Chas. Wright, and A.M. Strong. Their recommendations for officers were: President- Dr. Wendell O. Gregg; Vice President- Dr. Charles R. Wright; and Secretary-Treasurer- Mrs. Effie M. Clark. Nomination was made and carried that the report be accepted and those named be declared duly elected.

Dr. Gregg appointed the following committees:
Nomenclature- A.M. Strong, Mrs. E.P. Chace, and J.Q. Burch
Membership- Morris Caruthers, Charles R. Wright, and E.P. Baker
Program- Dr. H.R. Hill, W.G. Rador, and another to be added later.
Editor- J.Q. Burch
Historian- Elsie M. Chace

Dr. Wright then gave a talk on the joys and perils of shell collecting with sometimes Jap bombs falling entirely too near for comfort, of sharks and barracuda sometimes hovering on the side lines and much too close for comfort. While he actually came across no instances of damage done by Conus written warnings were issued to the troops to beware of all cones and there were persidtent rumors of some damage and, at least, one deat resulting from their sting.

In several places barracuda were reported to be greater menace thab sharks, though Dr. Wright said a shark, on one occasion, had him " plenty scared."

He brought some beautiful shells from various newly historic locations and said he had quite a large number awaiting a general clean up and identification.

Dr. Hill reported the discovery of a beautiful submerged coral reef off Catalina that will be reported on later with the addition of new range localities of several species.

The meeting was then duly adjourned.

Effie M. Clark- Secretary.

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Dr. Joshua L. Baily Jr. sends the following very interesting note which will necessitate changing at least one of the names we used, namely Eratidae.

" I have consulted a Greek scholar about the formation of some family names, with the following results:

Erato	Eratidae
Amphiperas	Amphiperatidae
Potamides	Potamididae

I have seen the first two spelled three different ways each, and the last spelled two different ways."

Professor H.W. Miller, Academia Adventista Hispanoamericana, Apartado 1320, San Jose, Costa Rica, A.C.

" I surely don't want to miss the Minutes. Received the October number and I believe you will have to extend the range of Neosimnia avena Sowerby, as a friend and I collecting at the Boca de Barranca, a few kilometers below Puntarenas, found two specimens, one 9 mm. and the other 12$\frac{1}{2}$ mm., which agree perfectly with the figure in Panamic Marine Shells, M. Smith, and the breadth of the small one is 42% of its length, while that of the larger one is 44%. No other species in your table approaches that ratio of breadth and length. The color does not agree with the table but does agree with the description given on page 39 of the Minutes. With these new tables, lists, and descrip--tions, collecting on the west coast is going to be more interesting than ever if I can get time to do any.

I also think I have Acanthina grandis Sowerby. It is listed from the Galapagos, but my specimen looks like the figure of grandis in M. Smith's Rock Shell Catalog, and does not resemble specimens of muricata of equal size in my collection. What do you think of the possibility ? "

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Mrs. Ruth Paulus, 918 Harliss Ave., San Jose 10, Calif. is interested in purchasing shells. Perhaps some of the members will wish to write her.

Dr. O.H. Wolner, St. Peter, Minnesota, is also interested in purchasing shells.

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West Coast Exchangers notice. The following message received by the editor should be given attention. If the press of other business did not prevent his exchanging at this time, no doubt he would even now be shipping a box. The letter is from:

Dr. L.A.W.C. Vemmans, Tolsteegsingel 13, Utrecht, Holland. " I saw your advertisement in the Nautilus and should be very much obliged if you could send me West Coast Shells. It is not necessary to give me first your list as I don't possess anything from the coast of California.

First of all I collect land and fresh water mollusks, but I have also a great collection of marine shells. You would please me if you would send more than one specimen of the same species (e.g. at least 2 or 3).

For exchange I can send you most of the European West Coast mollusks and if you will, also most of the Dutch land and freshwater species.

All of my specimens are provided with finding place and datum. I can give you also Netherland fossils from D. Lem-Stratum."

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Earl C. Huffman, 356 Stanton St., Pasadena 3, Calif. Earl has just written that he failed to receive the November issue. If any other members fail to receive issues please advise the editor.

Mr. F.M. Bayer, Florida State Museum, Gainesville, Florida. We are indeed happy to hear from Ted who has been in the service. The following from his letter will interest his friends. " My duties as Assistant Director of the Florida State Museum resume Jan. 1st. and my address will be there." ".. " Have just returned from the Pacific Area and find a huge accumulation of Minutes. These I plan to bind when you publish the December number.."

Mr. and Mrs. John Dyas Parker, 309 North Fourteenth St., Muskogee, Okla. One of the nicest things about Christmad cards is that you get the recent addresses of old friends. We all recall with pleasure the interesting talks of Mr. Parker.

Additions and Corrections

In Minutes #39, pp. 17-18, September,1944 we discussed the species Circe margarita and subtrigona Carpenter,1857.

Dr. Fritz Haas, Fieldiana-Zoology, Chicago Natural History Museum, Vol. 31, No.2, Sept. 19,1945pp 4,5. In this paper Dr. Haas discusses the entire problem with some very interesting notes. A paratype of Circe subtrigona was discovered in the Chicago Museum. Dr. Haas diagnosed this specimen as a Semele. Dr. A. Myra Keen in our discussion had found the specimen in the National Museum to be a Petricola. However, it seems that it is certain that the species under consideration is hot a Circe and not even a venerid.

In the same paper Dr. Haas has a number of other well illustrated papers- " Late Pleistocene Non-Marine Mollusks from Honduras"- " Some Peruvian Land and Fresh-Water Mollusks"- " The Systematic Position of Plectopylis Coarctata Moellendorff"- " A Second Record of Bradybaena Similaris from the United States"- " Strobilops Aenea Pilsbry from Oahu, Hawaiian Islands.".

Another number- No. 3 of the same publication is devoted to a fine paper , 15 pp and 1 pl. " Some Remarkable Shells of a South American Fresh-Water Mussel". The species is Anodontites ensiformis Spix.

* Note* Some years ago the editor of the paper received from the River Jurua,Brazil a large box of what he identified as this species, and the shells do compare with Dr. Haas figures. However, specimens of these were sent out on exchange or gift to perhaps a hundred or more labelled Glabaris ensiformis Spix. It is suggested that my friends correct the nomenclature on the labels to the name used by Dr. Haas- Anodontites (Lamproscapha) ensiformis Spix.

Johnsonia No. 18 containing the index of Vol. I, Numbers 1 to 18 has been delivered. In addition to the index there are a number of additions to the previous issues. Number 19 will start Vol. II.

California Fish and Game Vol. 31, No. 4, Oct. 1945 has been delivered.

Dr. Alberto Carcelles, Notas Del Museo De La Plata, Tomo VIII, Zoologia no.72, " Observaciones sobre Trophon varians (d'Orbigny)". 1943

This well illustrated paper from Argentina is of some interest to us in connection with our recent consideration of the species Trophon geverbianus (Pallas), the genotype. The species here discussed is closely related.

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The very best of the season's greetings to all of our friends from the Burches- John, Rose, Tom,Beatrice, and John III.

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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
January 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please mail all shell news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone AX 2-7965

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We will follow our annual custom of publishing a list of all members and friends, each name followed by numbers indicating their interests by the following key. Please drop a card or letter to the editor listing your interests.

1. World Wide Sea Shells
2. Pacific Coast Shells
3. Marine Shells
4. Land and Fresh Water Shells
5. Buy Shells
6. Sell Shells
7. Exchange Shells
8. Buy Books
9. Field Collecting
10. Marine Life in General
11. Fossil Shells

Please mention any additional interests not on the list.

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Mrs. Ida Worthy, Patumahoe, Auckland, New Zealand is the newly appointed overseas correspondent of the Auckland Museum Conchology Club, and we have been receiving the latest issues of the proceedings of their club. They are very interesting and our club and theirs will have a great deal in common.

Incidentally, all of our foreign correspondents are cordially invited to send their names and interests to this editor for publication in our Minutes. Those interested in exchanging would be almost certain of getting prompt results.

Genus Rissoina d'Orbigny,1840. Type (by original designation), Rissoina inca d'Orbigny.

" Rissoiform, ribbed or cancellated, whorls numerous, apex mamillated; aperture semilunar, lip thickened within, a little reflected, anteriorly effuse or faintly channeled, operculum corneous,semilunar, thick, paucispiral, with a claviform process on the inner face." (Tryon, Manual of Conchology).

The following key is from Mr. A.M. Strong's notebook.

Spiral sculpture present
. Spiral sculpture on both spire and base
.. Axial sculpture of prominent ribs
... Ribs sublamellar, interspaces with cloth-like sculpture
.... Length of adult shell about 5 mm. Panama. ....firmata C.B. Adams
.... Length of adult shell about 3 mm. Gulf of Calif. .. excolpta Carp.
... Ribs not sublamellar, sculpture not cloth like
.... Summit of whorls shouldered
..... Base with a distinct fasciole
...... Length of adult shell about 9 mm. Galapagos .... io Bartsch
...... Length of adult shell about 7 mm. Galapagos .... dina Bartsch
..... Base without a fasciole
...... Shell elongate conic
.... Spiral sculpture exceedingly fine Gulf of Calif...mazatlanica Bartsch
.... Spiral strong Peru .... helena Bartsch
...... Shell broadly conic
.... Base with strong cords and fine lines Gulf of Calif. ..favilla Bartsch
.... Base with uniform cords
.... Interspaces about as wide as the ribs
.... Whorls strongly,roundly shouldered. Panama ...... fortis C.B. Adams
.... Whorls narrowly shouldered. Gulf of Calif. .....stricta Menke
.... Interspaces twice as wide as the ribs
.... Basal cords 11 Panama .... gisna Bartsch
.... Basal cords 15 or more . Peru.................inca d'Orbigny
.... Summit of whorls appressed, not shouldered
..... Shell broadly conic or elongate ovate
...... Upper half of base smooth Gulf of Calif. ..... expansa Carpenter
...... Entire base sculptured. Lower Calif. .... bartholowi Bartsch
..... Shell elongate conic
...... Axial ribs 20 Guadalupe Island .... guadalupensis Strong
...... Axial ribs more than 20
.... Last whorl inflated Cape San Lucas .....peninsularis Bartsch
.... Last whorl not inflated
.... Axial ribs 32 Panama .... adamsi Bartsch
.... Axial ribs 40 or more
.... Axial ribs slightly protractive. Gulf of Calif. ..townsendi Bartsch
.. Axial sculpture more or less obsolete
... Whorls shouldered at the summit
.... Base with 10 spiral cords . Gulf of Calif...........berryi B. H. & S.
.... Base with 20 spiral threads. Lower Calif............kelseyi D. & B.
... Whorls not shouldered at the summit
.... Axial ribs entirely obsolete .
.... Axial ribs not entirely obsolete
..... Spiral threads on penultimate whorl 7-8
...... Whorls evenly rounded Cape San Lucas ....stephensae B. H. & S.
...... Posterior 2/3 of whorls flattened. Cape San Lucas. melanoides B.H.& S.

(con.)

..... Spiral threads of penultimate whorl 16
...... Spiral threads equal Guadelupe Island .... lowei Strong
...... Spiral threads unequal Gulf of Calif......... lapazana Bartsch
. Spiral sculpture on base only
.. Axial ribs entirely obsolete Panama .... laurae deFolin
.. Axial ribs not entirely obsolete
... Base with many spiral cords Panama .... zeltneri deFolin
... Base without many spiral cords
.... Base with two keels Sononata,Mex. .... contabulata Morch
.... Base with 1 keel and 2 incised lines Gulf of Mex... hista Bartsch
Spiral sculpture absent
. Axial ribs strong
.. Interspaces between ribs sculptured
... Interspaces with irregular crinkly markings. Lower Calif...cleo Bartsch
... Interspaces with fine axial threads
.... Whorls decidedly inflated. Lower Calif. .... bakeri Bartsch
.... Whorls not inflated. Gulf of Calif...............woodwardi Carpenter
.. Interspaces between ribs smooth
... Summit of whorls shouldered
.... Axial ribs lamellar Gulf of California ....burragei Bartsch
.... Axial ribs not lamellar
..... Axial ribs on penultimate whorl 12 Gulf of Calif.... porteri B.H. & S.
..... Axial ribs on penultimate whorl 22 Lower Calif. ....nereina Bartsch
... Summit of whorls not shouldered
.... Whorls constricted below the summit Central America..[illegible]
effusa Morch
.... Whorls not constricted below the summit
..... Base with a fasciole Lower Calif. ....californica Bartsch
..... Base without a fasciole
...... Axial ribs terminating at the periphery Guadalupe Island..
willetti Strong.
...... Axial ribs extending to the umbilical region
.... Axial ribs on penultimate whorl 16 Gulf of Calif. .. mexicana Bartsch
.... Axial ribs on penultimate whorl 20. Panama ..... clandestina Adams
. Axial ribs more or less obsolete
.. Shell elongate ovate Lower Calif. .... cerrosensis Bartsch
.. Shell elongate conic
... Shell slender, length 2.8 mm. Lower Calif. ....dalli Bartsch
... Shell stouter, length 3.5 mm. Lower Calif. ...... coronadoensis Bartsch

Rissoina kelseyi Dall and Bartsch,1902 San Pedro to Coronado Island
Rissoina californica Bartsch,1915. Catalina to Guadalupe Isl.
Rissoina cleo Bartsch,1915. Coronado Isl. to Guadalupe Isl.
Rissoina dalli Bartsch,1915. San Pedro to Coronado Isl.
Rissoina bakeri Bartsch,1915. Monterey to Cape San Lucas
Rissoina coronadoensis Bartsch,1915. Catalina to San Martin Isl.
Rissoina cerrosensis Bartsch,1915. Cerros Island
Rissoina townsendi Bartsch,1915. Agua Verde Bay
Rissoina bartholowi Bartsch,1915. Conception Bay
Rissoina burragei Bartsch,1915. Gulf of Calif.
Rissoina nereina Bartsch,1915. Pt. Sbreojos to Cape San Lucas
Rissoina favilla Bartsch,1915. Cape San Lucas
Rissoina woodwardi Carpenter,1856 Gulf of Calif.
Rissoina hartmanni Jordan Pleistocene- Magdalena Bay
Rissoina stephensae B. H. & S. Cape San Lucas
Rissoina berryi B. H. & S. Cape San Lucas
Rissoina porteri B. H. & S. Gulf of California

(con.)

Rissoina melanoides B. H. & S.	Cape San Lucas
Rissoina expansa Carpenter,1865	Gulf of Calif.
Rissoina peninsularis Bartsch,1915	Gulf of Calif.
Rissoina firmata C.B. Adams,1852	Gulf of Calif. to Panama
Rissoina stricta Menke,1850.	Gulf of Calif.
Rissoina excolpta Bartsch,1915	Gulf of Calif.
Rissoina mazatlanica Bartsch,1915	Gulf of Calif.
Rissoina mexicana Bartsch,1915.	Gulf of Calif.
Rissoina lapazana Bartsch,1915.	La Paz
Rissoina histia Bartsch,1915.	La Paz
Rissoina constabulata Morch,1861	Sononata
Rissoina guadalupensis Strong	Guadalupe Island
Rissoina lowei Strong	" "
Rissoina willetti Strong	" "
Rissoina effusa Morch,1860	Central America
Rissoina fortis C.B. Adams,1852	Panama
Rissoina clendestina C.B. Adams,1852	Panama
Rissoina janus C.B. Adams,1852	Panama
Rissoina zeltneri de Folin,1867	Panama
Rissoina laurae deFolin	Panama
Rissoina signae Bartsch,1915	Panama
Rissoina gisna Bartsch,1915	Panama
Rissoina adamsi Bartsch,1915	Panama
Rissoina io Bartsch,1915	Galapagos
Rissoina dina Bartsch,1915	Galapagos
Rissoina inca dOrbigny,1840	Bolivia and Peru
Rissoina helena Bartsch,1915	Peru
Rissoina allemani Bartsch,1931	Bay of Panama

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Genus Rissoina d'Orbigny,1840.

Reference- Bartsch, Paul, 1915 " The Recent and Fossil Mollusks of the Genus Rissoina from the West Coast of America", Proc. U.S.N.M. vol. 49, pp. 33-65, pls. 28-33.

Rissoina kelseyi(Dall and Bartsch)1902. Redondo Beach, Calif. (Burch) south to the Coronado Islands, Lower Calif. Type locality,San Diego.

Mr. A.M. Strong says of this species in his notebook." Rissoina kelseyi differs from nearly all the species in the genus in being variously colored, yellow to light red, unicolor, or longitudinally streaked, instead of uniformly pure white or bluish white. It belongs in the group with faint axial sculpture, but the spiral striations are strongly incised and continuous."

It was described as Rissoa kelseyi Dall and Bartsch, Nautilus, vol. 16,1 1902. Alaba oldroydi Dall, Nautilus, vol. 19, 1905, p. 15 from 10 fms. off San Pedro is in the synonymy.

Collecting data: A common dredged shell in comparatively shallow water; off Malaga Cove, L.A. Co. in 10 to 15 fms., sand bottom; off Redondo Beach in 25 fms., sandy gravel; off Ensenada, Mexico in 15 fms. sand bottom; Punta Banda, Todos Santos Bay, L.C. (Burch) off S. Coronado Island in 18 fms. (Dr. F. Baker);

Rissoina californica Bartsch,1915. Catalina Island, Calif. to Guadalupe Island, L.C. Type locality, South Coronado Island, L.C.

Mr. A.M. Strong says of this species " Rissoina californica is a very small species and like the last has strong axial ribs with smooth interspaces but the whorls are not shouldered and there is an umbilical chink surrounded by a tumid area"

(con.)

Collecting data: Off South Coronado Island, L.C. (Dr. F. Baker); North Coronado Island (F. Stephens);

Rissoina bakeri Bartsch,1902. Monterey, Calif. south to Cape San Lucas, L.C. Type locality, San Pedro, Calif.

Mr. A.M. Strong states of this species " Rissoina bakeri Bartsch is one of the smallest species in the genus. Spiral sculpture is entirely absent and the interspaces between the well developed axial ribs are marked by slender, very strong axial threads."

Collecting data: Dredged off Monterey, Calif. in 15 fms. (Burch); 10-30 fms. in Monterey Bay. Specimens from the Bay are close to but not typical R. bakeri (A.G. Smith); No. Coronado Island (F. Stephens); South Coronado Island in 3-7 fms. (Dr. F. Baker); San Martin Island (Dr. F. Baker); Hilo, Hawaii (Dr. F. Baker); San Pedro (Lowe).

The Hawaiian record by Dr. F. Baker is of interest. Dr Baker was a good student of this group. His material is all in the San Diego Museum of Natural History.

Rissoina newcombei Dall,1897. Forrester Island, Alaska and south to Monterey,Calif. (Burch). Type locality, Cumshewa Inlet, British Columbia.

Collecting data: Dredged off Monterey, Calif. in 15 fms. shale bottom (Burch); Vancouver Island (Victoria Museum) (W.J. Eyerdam);

Rissoina cleo Bartsch,1915. Catalina Island, Calif. south to Guadalupe and San Martin Islands, L.C. Type locality, off S. Coronado Id. in 3 fms.

Mr. A.M. Strong states of this species " Rissoina cleo is a very small species with strong axial ribs, the interspaces between which the irregular wavy markings which give a watered silk effect."

Collecting data: San Martin Island, L.C. and So. Coronado Islands (Dr. F. Baker)

Rissoina dalli Bartsch,1915. San Pedro, Calif. to South Coronado Island. Type locality, San Pedro, Calif.

Mr. A.M. Strong comments on this species " Rissoina dalli is sculptured with numerous, very fine, closely spaced, axial threads. It is very similar to R. coronadoensis Bartsch , but it is a smaller and more slender shell."

Collecting data: White's Point, L.A. Co., Calif. littoral (Burch); San Pedro (Lowe); Coronado Islands (F. Stephens); White's Point and Avalon, Catalina Island (A.G. Smith).

Rissoina coronadoensis Bartsch,1915. Redondo Beach, Calif. (Burch) south to San Martin Island, L.C. Type locality, off Coronado Islands in 20 fms.

Mr. A.M. Strong comments on this species " R. coronadensis is a small, elongate-conic species sculptured with numerous, slender, axial threads separated by smooth spaces about as wide as the threads."

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms.; Pleistocene of Timm's Point, San Pedro (Burch); San Martin Island and So. Coronado Island in 14 fms. (Dr. F. Baker).

Rissoina sp.- Monterey Bay (A.G. Smith).

Family Anaplocamidae

Reference- Rehder, Harald A., Nautilus 56:49,50, Oct. 1942. The last lines of Dr. Rehders article will be self explanatory here " .... the family Anaplocamidae and the name Anaplocamus borealis Dall, are to be stricken from the rolls of marine mollusks."

Genus Jeffreysia Alder in Forbes and Hanley,1850. Type (by original designation) J. diaphana Alder.

The proposition Rissoella Gray,1847 vs. Jeffreysia Alder,1850 has been debated on many occasions. The following data will outline the matter.

Dr. A. Myra Keen reached the following conclusion (Per. Comm.,Nov.,1945) " Rissoella Gray,1847". Type, by original designation, Rissoa ? glabra Alder. Bartsch argues that Alder meant by Rissoa glabra the shell which later he named Jeffreysia diaphana, that this would therefore be type, and that Jeffreysia is a synonym of Rissoella. However, the Rissoa glabra of Alder is cited by him as the Rissoa glabra Brown. According to the International Rules, R. glabra Brown must therefore be the type of Rissoella. As Jeffreys points out in his British Conchology, Brown's description and illustration apparently refer to some species of Odostomia. Therefore, Rissoella is not available for use in the Rissoidae and must be replaced by Jeffreysia Alder in Forbes and Hanley,1850 (type by original designation, J. diaphana Alder.)."

John Gwyn Jeffreys " British Conchology" 1867, p.58.

Jeffreysia Alder- " Shell thin, smooth and glossy: mouth oval or roundish oval, with a complete peristome: operculum rather thin, having the nucleus on the middle of the inner side, and a short rib on the under side, which proceeds from the nucleus in the direction of the outer margin."

" Dr. Gray makes this synonymous with his undescribed genus Rissoella. The type indicated by him, in lieu of a description, is Rissoa glabra of Brown, which is evidently an Odostomia (probably O. raqsoides) , having a slight plication at the base. In Gray's classified list of the Mollusca published in 1847, Rissoella is given as a synonym of Odostomia."

Reference- Bartsch, Paul,1920 " The West American Mollusks of the Families Rissoellidae and Synceratidae, and the Rissoid Genus Barleeia," Proc. U.S.N.M. vol. 58, pp. 159-176, pls. 12-13.

Mr. A.G. Smith called attention to the small hooklike part of the operculum of this genus.

Mr. A.M. Strong uses Rissoella and comments on the species placed under it as follows " The following species are placed here only provisionally. The operculum is known in only two species and the anatomy in none. They are small, thin, white, ovate shells, smooth or with very fine sculpture. Some are umbilicate, others not, and quite probably represent more than one genus."

Rissoella anguliferens (de Folin),1870. Panama Bay
Rissoella bakeri Strong,1938. Guadalupe Island, L.C.
Rissoella bifasciata (Carpenter),1856. Cape San Lucas to Mazatlan.
Rissoella californica Bartsch,1927. San Clemente Id. to San Martin Id., L.C.
Rissoella excolpa Bartsch,1920. Gulf of Calif.
Rissoella johnstoni Baker,Strong & Hanna,1930. Cape San Lucas
Rissoella tumens (Carpenter),1856. Gulf of Calif.

Jeffreysia californica (Bartsch),1927. Proc. U.S.N.M. vol. 70, p.31, pl.4, fig.2. San Clemente Island to San Martin Island, L.C. Type locality, San Clemente Island.

The original description of this species seems to have been omited from Oldroyd. It follows:

" Shell small, thin, semitranslucent, bluish white, broadly ovate. Nuclear whorls smooth, scarcely differentiated from the postnuclear turns. Postnuclear whorls very strongly inflated, strongly rounded, marked by rather strong, retractively slanting, incremental lines and very feebly developed, almost obsolete spiral threads. Periphery of the last whorl inflated, strongly rounded. Base short, inflated, strongly rounded, with a rather broad, open umbilicus which is marked at its external termination by an obsolete angle. The sculpture of the base is like that of the spire. Aperture broadly oval,

(con.).

rather expanded at the junction of the basal and outer lips. Posterior angle acute; outer lip thin; inner lip strongly curved and expanded over the parietal wall, thus rendering the peritreme complete; the outside of the inner lip at the umbilicus is marked by strong incremental lines.

The type, Cat. No. 362453, USNM, was collected by Dr. R.H. Tremper on rocks at San Clemente Island, Calif. It has 4.2 whorls and measures, length 2.4 mm., diam. 1.16 mm.

I am placing this species in the genus Rissoella with some doubt, but until I will have seen anatomic material I hesitate to give it a distinct generic designation."

Mr. A.M. Strong comments on it as follows " Shell broadly ovate, semi-translucent, with strongly inflated whorls, with strong lines of growth and very feeble spiral threads. The periphery and base is round and the rathe r broad umbilicus is bordered by an obsolete angle."

Family Acmeadae

Genus Acmea Hartmann,1821. Type (by subsequent designation,Iredale, 1915),Acmea truncata Hartmann = Helix subcylindrica Linnaeus.

Dr. A. Myra Keen reached the following conclusion " To my surprise I find that we must abandon Truncatella Risso in favor of Acmea Hartmann,1821, as the latter has five years priority. Acmea Hartmann,1821, Neue Alpina, Bd. 1, p. 204 (fide Sherborn); type (by sub. desig., Iredale,1915),Acmea truncata Hartmann = Helix subcylindrica Linne.). As this species is also the type of Truncatella , there seems no alternative. One can appreciate Winckworth's concern over the similarity of Acmea to Acmaea. Family, Hydrobiidae fide Winckworth."

The Iredale reference on this problem is Proc. Mal. Soc. Lon. 11:332,1915.

" Shell minute, cylindrical, truncated; whorls striated transversely; aperture oval, entire; peristome continuous. Operculum corneous, subspiral." (Tryon).

Acmea stimpsoni (Stearns),1872. Redondo Beach, Calif. south to Tres Marias Islands, Mexico. Type locality, False Bay near San Diego, Calif. (i.e Mission Bay).

In Minutes # 48, p. 11, in the discussion of Pedipes unisculatus Cooper we mentioned that this species was found in vast numbers in the same habitat-rocky rubble above high tide and under usually about two feet of the rubble.

Collecting data: Malaga Cove below the Palos Verdes County Club at or above the high tide mark under stones interspersed with dead algae. Very abundant; Newport Bay; Avalon, Catalina Island. While it is true that occasional shells are collected in the bwteen tides area or even dredged in shallow water, it will be found in my opinion that all of these will be dead shells washed down from above the tide mark. (Burch); National City, Calif. (Mrs. Sweet); San Diego (Hemphill and Orcutt); Redondo (Kate Stephens); Todos Santos Bay, L.C. (Orcutt);

Acmea californica (Pfeiffer),1857. Santa Barbara, Calif. to San Martin Id., L.C. Type locality, San Diego.

Collecting data: Newport Bay, Calif.; Punta Banda, Todos Santos Bay, L.C.; Pleistocene of Timm's Point, San Pedro. (Burch); San Diego Bay (Baker, Hemphill and Orcutt); San Martin Island (Dr. F. Baker) (San Diego Museum).

Mr. Henry Dodge, 6 Rochambeau Road, Scarsdale, N.Y. has just written a brief note about this species, and inasmuch as my duplicate material is not at this time available his request may be taken care of by some of the members with my thanks. " I would be very gateful if you could find time to

(con.)

wrap up a few Truncatella californica Pfeiffer and send them to me. You sent me a nice lot of T. stimpsoni some time ago and I have a feeling that there are some californica among them. The only real difference in the two in the Binney and the Stearns descriptions seems to be in the thinness or thickness of the outer lip and the manner in which the parietal portion of the lip adheres to the shell. Some of those in the lot of stimpsoni you sent look almost like our Atlantic bilabiata, i.e. there is a fairly well-defined double peristome."

There is a variety of this species from the southern fauna, var. guadalupensis Pilsbry.

Truncatella bairdiana C.B. Adams,1852 is listed by Mr. Strong from Panama.

Genus Cochliopa The following species listed by Mr. Strong.
Cochliopa currugata Stearns,1890. Nicaragua
Cochliopa rowelli Tryon. Panama
Cochliopa trochulus Martens. Panama

Family Assimineidae

There seems to be a great deal of confusion among the authors about the proper taxonomy for this group. Bartsch,1920 places Assiminea Jeffreys in the synonymy of Syncera. Theile uses the family Assimineidae and genus Assiminea (Leach) Fleming,1828 placing Syncera in the synonymy with a ?

Dr. A. Myra Keen reached the following conclusion" I believe the evidence favors rejection of Syncera Gray,1821. Boththe genus and species are unidentifiable from the original. I note that Winckworth (Jour. Conch., vol.19, no. 7, 1932, p. 223) adopts Assiminea Fleming,1828, with type A. grayana Fleming. A discussion of opposing views occurs in Proc. Malac. Soc. Lon., vol. 15,1922, pp. 36 and 37, by Dall and Iredale, respectively. Also Winckworth, 1934, Jour. Conch. v. 20, p. 12. "

Dr. Joshua L. Baily Jr. comments on this problem (Per. Comm. Nov.,1945) " The choice between Syncera and Assiminea is somewhat involved. Syncera is the older name, but Gray's description is unsatisfactory. Gray does not describe the shell or the radula, but only the eyes. Now it so happens that Strombus has the same kind of eyes, and Gray's description therefore applies equally well to either Assiminea or Strombus.

Whether this is a legitimate reason for discarding Syncera I cannot say. If there is anything in the context to indicate that Syncera is meant for Assiminea , then Syncera is the correct name, but if there is nothing to show whether Assiminea or Strombus is meant, then Syncera is a nomen nudum. I can express no personal opinion as I have never examined Gray's work. I can only repeat what others have told me, and it is astonishing how evenly divided opinion seems to be.

Genus Assiminea Fleming,1828. Type, A. grayana Fleming.

" Shell conic,usually strong. Nuclear whorl smooth, the rest of the shell marked by lines of growth and fine spiral striations only. Outer lip simple; inner lip continuing over the base as a thick parietal callus. Operculum subspiral,thin,horny." (Bartsch).

Assiminea translucens (Carpenter),1864. Vancouver Island to Lower Calif. Type locality, San Diego, Calif. in shell washings.

Collecting data; Mugu, Ventura Co., Calif. in debris along the edge of the lagoon, very abundant; very common in with Phytia setifer Cooper on the mud flats of Terminal Island; Malaga Cove,L.A. Co. above the high tide mark (Burch); Monterey Bay at low tide- rare; Bolinas Bay; Anaheim Bay; Newport

(con.)

Bay; White's Point (A.G. Smith); National City (Emery and Orcutt); San Francisco (Hemphill).

Family Capulidae

Genus Capulus Montfort,1810. Type (by original description),Capulus hungaricus Linnaeus.

" Shell conical, apex posterior, spirally recurved; aperture rounded; muscular impression horshoe-shaped." (Tryon).

Capulus californicus Dall,1900. Redondo Beach, Calif. (Burch) south to Cape San Lucas. Type locality, on Pecten diegensis from off San Pedro in 20-25 fathoms.

Collecting data: We have taken it rather rarely off Redondo Beach and also off San Diego, always commensal on Pecten diegensis Dall (Burch); Catalina Island (Lowe);

Genus Piliscus Loven,1859. Type (by monotypy), Pilidium commodium Midd.

"Shell thin, patelliform, with thin epidermis; apex not spiral, somewhat inclined to the right and posteriorly." (Tryon & Pilsbry, Man. of Conch.)

Piliscus commodus (Middendorff),1851. Arctic Ocean to Pribilof Islands, Bering Sea and the Okhotsk Sea (Dall). Type locality, Okhotsk Sea.

Family Hipponicidae

Genus Hipponix Defrance,1819. Type (by subsequent designation, Anton, 1839), Patella cornucopia Lamarck.

" Shell thick, obliquely conical, apex posterior; base shelly, with a horshoe-shaped impression, corresponding to that of the adductor muscle." (Woodward).

The name Amalthea Schumacher is often used, but according to Woodward, 1928, p. 373, this is a homonym of Amalthea Rafinesque.

Hipponix barbatus Sowerby,1835. Crescent City, Calif. to Guayaquil (Dall) also Hawaii (Kein). Type locality, coral reefs around Tooboua, one of the Society Islands.

None of our members have recognized this species from California. Mr. E.P. Chace comments " Calif. records probably based on jumped locality labels or wrong identification. Zetek lists it from Panama. H.N. Lowe lists it from Acapulco, Tres Marias Islands, Mazatlan etc." Mr. Strong comments on following page.

Hipponix serratus Sowerby,1835. Moss Beach, Calif. (Voorhees) (Stanford Coll. south to Panama. Type locality, Mazatlan?mexico.

Dr. A. Myra Keen makes an interesting comment on this species, (Per. Comm. 11/45) " It is possible that Hipponix antiquatus Linne is replaced on our coast by H. serratus and that we do not have the true antiquatus." H.N. Lowe lists the species from Mazatlan, La Paz and south. It is not in Zetek's list of Panama shells. Mr. E.P. Chace calls attention to the fact that Carpenter in Mazatlan Catalogue gives a description and many notes only about ¼ of which is reprinted in Oldroyd.

Mr. A.G. Smith comments " Monterey (Dall). Think the record is doubtful and needs confirming before accepting it as valid."

Discussion continued on page 11. *

Genus Hipponix Defrance, 1819. Type (by subsequent designation, Anton, 1839), Patella cornucopia Lamarck.

" Shell thick, obliquely conical, apex posterior; base shelly, with a horshoe-shaped impression, corresponding to that of the adductor muscle." (Woodward).

The name Amalthea Schumacher is often used, but according to Woodring, 1928, p.373, this is a homonym of Amalthea Rafinesque.

The following keyand notes are from Mr. A.M. Strong's notebook.

Sculpture with the concentric laminae predominating
. Radial sculpture fine, close, or obsolete
.. Apex near the posterior edge
Crescent City, Calif. to Peru .... antiquatus
Oldroyd 2-3-112; Bull. Fish. Comm. 1900, p. 437
.. Apex central British Columbia to San Pedro .... cranoides
. Radial sculpture of tuberculate ribs near the apex, continuing as indented striae near the edge
Monterey to Panama .... serratus
Maz. Cat. #346
. Radial sculpture of low ribs, base spreading
Gulf of California .... planatus
Maz. Cat. #345
Sculpture with the radial ribs predominating
. Ribs close, nodulous, margin crenulated
Crescent City to Panama .... barbatus
Oldroyd 2-3-114; Max. Cat. #349
. Ribs scarce, margin acute , ribs smooth
Crescent City to Socorro Island .... tumens
Oldroyd 2-3-113
. Ribs sparce, ribs nodulous, margin laminated
Gulf of Calif. to Peru .... grayanus
Maz. Cat. # 350; Tryon 8-135
Sculpture with concentric laminae near the apex and radial ribs near the margin. Gulf of California .... delicata
Bull. Mus. Comp. Zool. 43-331

Hipponix antiquatus Linnaeus, 1767	Crescent City to Peru
Hipponix tumens Carpenter, 1865	Crescent City to Clarion Island
Hipponix serratus Carpenter, 1856	Monterey to Panama
Hipponix barbatus Sowerby, 1835	Crescent City to Panama
Hipponix grayanus Monke, 1853	Mazatlan to Peru
Hipponix planatus Carpenter, 1857	Mazatlan
Hipponix subrufa Lamarck, 1819	Panama to Peru- Atlantic
Hipponix delicatus Dall, 1908	Panama

The type locality of H. antiquatus Linnaeus is not known. Carpenter lists the species from West Africa, West Indies and Gulf of California and Panama. Adams has H. panamensis, new name for H. mitrula Sby (not Lamarck, the West Indian shell). Carpenter in Maz. Cat. gives this as a synonym of H. antiquatus but in P.Z.S., 1856, p.363, as a synonym of H. subrufa Lam. Both Dall in Peruvian Fauna and Zetek list H. subrufa as occuring from Panama to Peru in the Pacific as well as in the Atlantic.

It is possible that the species can be divided into the following geographic races.

H. antiquatus Linnaeus, West Africa
H. subrufa Lamarck, West Indies
H. panamensis C.B. Adams, Panama to Peru
H. serratus Carpenter, Gulf of Calif. to Central America (con.)

H. cranoides Carpenter, California

The type locality of H. barbatus Sowerby is in the Society Islands. It was applied to the Panama shell by C.B. Adams. There does not seem to be any other name applied to the west coast shell.

The type locality of H. grayanus Menke seems to be St. Vincent Island (Guinea) tho Carpenter does not make a definite statement. Adams uses H. radiatus Gray,1835 (not Q. & G.,1824). H. crispa Menke is also said to be a synonym but Carpenter does not state where it is from.

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* Discussion continued from page 9

Hipponix antiquatus Linnaeus,1767. Crescent City, Calif. to Peru
Type locality unknown. This species is listed from the Florida Keys, West Indies and elsewhere and is apparently of word wide distribution. The above discussions indicate the diversity of opinion regarding it. It would be a waste of paper to attempt a list of collecting localities for this very common littoral species. In our experience it is to be taken in all rocky habitats from Monterey to Mexico. It is a littoral species but we have picked it up from as deep as 10 fathoms apparently living there. (Burch); Hilo, Hawaii; Narrabeen (San Diego Museum); Monterey Bay, common (A. Smith).

Hipponix cranoides Carpenter,1864. Vancouver Island to San Pedro.
Type locality, Vancouver Island area.

It has always been my opinion that this is simply another of those species described from a variation caused by habitat. Obviously, H. antiquatus varies greatly to conform to its location, and I have considered cranoides of very doubtful value. However, IF it should be found that our west coast species is not typical H. antiquatus, then it is quite possible that this is the name to be used for it. Mr. A.G. Smith comments " Think cranoides has little dystematic value and should be in synonymy with the typical form." Mr. E.P. Chace says " I do not consider it even a subspecies-- " flat" because it grew in a very narrow crack in the rocks and could not assume the normal form." However, there are sets in the San Diego Museum with the following labels; Crescent City (Chace); Cambria (Wilcox); Pt. Loma (K. Stephens); La Jolla (Beckwith); Point of Rocks, L.C. (Dr. F. Baker).

Hipponix tumens Carpenter,1865. Crescent City, Calif. to Clarion Island.
Type locality: Monterey-San Pedro-San Diego.

Collecting data: While it is true that we have collected this form littoral in almost the same habitat as antiquatus, the two differ in that tumens in our experience prefers crevices, and in addition we seem to have dredged tumens from considerably deeper water than antiquatus. We found tumens rather common in dredging on the shale off Monterey down to as deep as 40 fms., and have brought it up from 25 to 35 fms. off Redondo Beach and also off Catalina Island. It is unusually common in the rubble at San Onofre and also at Punta Banda. (Burch); Monterey 0 to 20 fms. (A.G. Smith); San Nicholas Island (Lowe); San Pedro (Lowe and F. Stephens); Cambria (Wilcox); San Diego (Hemphill); La Jolla (Bristol and Beckwith) (San Diego Museum).

Family Crepidulidae

Genus Crepidula Lamarck,1801. Type (by monotypy), Patella fornicata Linnaeus.

" Shell oval, limpet-like; with a posterior, oblique, marginal apex; interior polished, with shelly partition covering its posterior half" (Woodward).

The following list of species is from Mr. A.M. Strong's notebook.

Crepidula onyx Sowerby,1824	Monterey to Chile
Crepidula excavata Broderip,1834	Monterey to Peru
Crepidula adunca Sowerby,1825	Vancouver to Cape San Lucas
Crepidula orbiculata Dall,1919	Bering Sea to San Diego
Crepidula aculeata (Gmelin),1791	Port Harford to Chile
Crepidula exuviata Nuttall	California and south
Crepidula incurva (Broderip),1834	San Pedro tp Peru
Crepidula dilatata Lamarck,1824	Gulf of Calif. to Chile
Crepidula arenata Broderip,1834	Scammons Lagoon to Peru
Crepidula crepidula Linnaeus,1764	Gulf of Calif. to Peru
Crepidula squama Broderip,1834	Panama to Patagonia
Crepidula lessonii Broderip,1834	Panama
Crepidula rostrata C.B. Adams,1852	Panama
C. (Crepipatella) lingulata Gould,1846	Bering Sea to Panama
C. (Crepipatella) strigata Broderip	Peru to Magellan Strait
C. (Ianacus) nummarius Gould,1846	Bering Sea to Mazatlan
C. (Ianacus) fimbriatus Reeve,1859	Vancouver to Panama
C. (Ianacus) perforans Val.,1846	Puget Sound to Panama

Genus Zeidora

Zeidora flabellum Dall,1902. Clarion Island

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Subgenus Crepidula s.s.

Crepidula grandis Middendorff,1849. Cape Franklin, Arctic Ocean, south and east to Sitka,Alaska. Also Kamchatka. (Dall).
Type locality, St. Paul Island, Bering Sea.

Collecting data: Izhut Bay, Afignak Island, Kodiak group, Alaska; Atka Island, Aleutian Islands,1932 (W.J. Eyerdam); fossil at Capitola, Santa Cruz Co. and also Los Angelos near 5th and Olive (Grant and Gale) (E.P. Chace).

Crepidula onyx Sowerby,1824. Monterey, Calif. to Chile.
Type locality not given.

Collecting data: This very common species seems to thrive in almost every habitat. It is found far up in the estuaries as well as in the open sea. It is often taken on other species as well as stacking up on other specimens of the same species. We have taken it from Pecten, Megathura,Kelletti Conus and many other littoral gastropods. The bathymetric range is of some interest since we have found it rather common off Redondo Beach down to nearly 50 fms.

There is a race of this species in Todos Santos Bay, L.C. that is much smaller and of a uniformly different shape. The deck is obviously an onyx deck though, and at best it could be but a subspecies. However, they are sufficiently different to be separable,and sooner or later I expect someone to describe them. They may be found either in the Estero or out on Punta Banda.

(con.)

The subspecies rugosa Nuttall, MS,Carpenter,1856 has been generally irnored or placed in the synonymy of the typical. It is supposed to be those with the heavy rough periostracum, but this species assumes almost every variation immaginable. It is of no consequence in my opinion.(Burch).

Mr. E. P. Chace comments " Punta Banda form of C. onyx has a leaning towards C. incurva, a southern form. H.N. Lowe got incurva at Guaymas and south."

Mr. A.G. Smith writes " The Monterey record needs confirming and an extension of range this far north not accepted as valid until it is."

* Note* It is true that none of our members have reported C. onyx from Monterey. I have never recognized it from there. However, this is a Dall record and the material on which it is based is presumably in the U.S. Nat. Mus. We are therefore almost bound to continue these Dall records until they are definitely proven to be erroneous.*

Crepidula excavata Broderip,1834. Monterey, Calif. to Peru.
Type locality, Real Llejos (Nicaragua).

Collecting data: Common on Polinices between Seal Beach and Huntington Beach; also on Polinices in the Estero below Ensenada, common; a small form of excavata is very common commensal on the small Mitrella carinata in the Estero de Punta Banda and occasionally also found on Conus although the usual form on Conus is onyx. Dredged off Malaga Cove and also off Catalina Island in comparatively shallow water. Abundant in the Pleistocene of the Baldwin Hills, Del Rey deposit (Burch); Pt. Reyes on Haliotis rufescens, 1 fine specimen(A.G. Smith); a long narrow form grows on the tall spined shells, Turritella, Drillia etc. - used to be faitly common at Sea Beach- also on Olivella biplicata at Seal Beach. (E.P. Chace); San Felipe,L.C. (F. Stephens); San Diego (Kelsey); Long Beach (Lowe); Montijo Bay, Panama (Lowe) (San Diego Museum);

Crepidula excavata naticarum Williamson,1905. In my opinion there is no more useless name on the list. If anyone can show me how to separate C. excavata in my collection taken from a dozen or more different things and those from off the Polinices, I will be very much interested to hear.(Burch).
" Agree that this has little or no systematic value. If you call norrisiarum a species then would'nt naticarum be a synonym of this rather than excavata? (A.G. Smith).

Crepidula norrisiarum Williamson,1905. Type locality, San Pedro on Norrisia. I held forth for years that this is a good species. However, I am now disposed to think that it should be in the synonymy of excavata. After seeing specimens in Mr. A.G. Smith's collection and comparing them with typical excavata it is my present opinion that they cannot be separated. Obviously the specimens living on Norrisia would assume some variation. We have taken this everywhere we have found Norrisia , and for that matter there is apparently no difference between those from Norrisia and those from Haliotis and other forms. We have taken it from H. cracherodii at Cayucos, Calif. and south to Punta Banda and Arbolitos. It is unusually common around Malaga Coveand in Todos Santos Bay (Burch).

Dr. Joshua L. Baily Jr. comments " Crepidula norrisiarum looks like a good species to me, but Dr. Wesley Coe, of the Scripps Institution at La Jolla, does not. As he has raised it experimentally I would be inclined to accept his judgement."

However, for the benefit of those who may still maintain it as a species the following collecting localities have been submitted: Common on Norrisia at Refugio,Santa Barbara Co. (E.P. Chace); Coronado on Norrisia (Bristol); San Diego (Chaney); Ocean Beach (Kate Stephens); La Jolla (Edna N. Wilson); San Diego (Gripp); San Pedro (Dr. F. Baker); Long Beach (Lowe).

Crepidula arenata (Broderip),1834. Proc. Zool. Soc. London, Part II, p. 0.
La Jolla, Calif. (A.G. Smith), south to Peru.

The original description of this species which Mr. Smith now adds to the California fauna follows:

" C. testa subovata, albida rubro-fusco creberrime punctata; intus subrubra vel albida subrubro maculata, septo albo: long. 1 1/8, lat. 7/8, alt. 4/12 poll. Hab. ad Sanctam Elenam." (i.e northern Ecuador.)

" This approaches Crepidula porcellana. The septum is somewhat distant from the margin, and the apex, which is also somewhat distant from it, is obtuse and obliquely turned towards the right side. From sandy mud, on shells , at a depth ranging from six to eight fathoms."

Crepidula incurva Broderip,1834. San Pedro, Calif. to Peru.
Type locality: Santa Elena and Xipixapi (Ecuador), 6-10 fms.

" Testa fusco nigricante, tortuosa, corrugata, intus nigricante,septo albo, apice adunco. Long 6/8, lat. ½, alt. 3/8 poll."

Collecting data: This is another species of the southern fauna with a very questionable California record. I have certainly seen nothing from California that resemble those for example from Panama sent by Zetek.(Burch). Many localities from Lower Calif. to Panama taken by Frank Stephens and Lowe (San Diego Museum- Miss Bristol).

The original description of this species was omited from Oldroyd so we gave it above,

See discussion on page 18- top of page

Crepidula orbiculata Dall,1919. Bering Sea to San Diego,Calif.
Type locality, Royal Roads, Victoria, Vancouver Island, B.C.

Collecting data; 52-55 fms. off Pt. Pinos (A.G. Smith).

Crepidula fornicata Linnaeus,1758 Coast of Washington introduced from the Atlantic.

Collecting data: Willapa Bay, Wash. almost certainly introduced with seed oysters (E.P. Chace); on native oysters (Ostrea lurida) near Olympia, Wash. Introduced from Atlantic. (W.J. Eyerdam).

Crepidula convexa glauca Say,1822. Alameda,Calif. introduced with seed oysters from the Atlantic. Johnson gives the Atlantic range, Nova Scotia to Florida and Texas.

Mr. A.G. Smith calls attention to Packards records of this species. South San Francisco Bay near the oyster beds (Packard). Packard,1918, Molluscan Fauna of S.F. Bay, p. 323, places glauca in the synonymy of convexa."

Crepidula adunca Sowerby,1825. Vancouver Island to Cape San Lucas.
Type locality not given.

Collecting data: Our experience has been to find this a very common species in the northern part of the range becoming increasingly raro in southern California. We have taken it at Crescent City; Monterey; San Simeon; Cambria;Cayucos- common on Tegula; dredged off Monterey in 10 to 20 fms.; Bird Rock and Mission Bay, San Diego Co. (Burch); dredged off S. Coronado Island in 14 fms. (Dr. F. Baker); Puget Sound (W.J. Eyerdam); Crescent City to So. Coronado Islands. (San Diego Museum).

Crepidula aculeata (Gmelin),1792. Port Harford to Chile.
Type locality: Ad insulas Americae Mediae "

This species must be of world wide distribution or else not well enough known. Johnson reports it from the Atlantic, North Carolina to Texas and the

(con.)

West Indies. I note that in my collection I have sets from Queensland as well as New South Wales, Australia; Brazil; Hawaiian Islands; South Africa etc. They all look very much alike.

Collecting data: Our experience has been to find this species comparatively rare. However, we have taken it from a great many localities: Cayucos, San Dimeon, Monterey, Malaga Cove, Point Formin, Bird Rock, La Jolla, San Onofre, and other points. One possible note of interest is that an excellent place to look for them is on kelp holdfasts. (Burch). It was suggested by Mr. A.G. Smith that perhaps some of the records of this species such as mine from Monterey may be of C. orbiculata Dall,1919. This is quite possible since very few of us are familiar with orbiculata.

Mr. W.J. Eyerdam writes " I have this species through exchange from Florida and several other Atlantic localities. I have collected it at Cayucos, Calif., Mazatlan, Mexico; Gulf of Fonseca, Honduras; La Union, Salvador; Corinto, Nicaragua; Supe, Peru; and Arica, Chile. They are all about the same."

Genus Crepipatella Lesson,1830. Type (by subsequent designation, Gray,1847): Calyptraea adolphei Lesson= Crepidula dilatata Lamarck. In dilatata, as in lingulata, the deck is separated from the shell on one side. (Dr. A.M. Keen). * See discussion bottom of page 17.

Crepipatella lingulata Gould,1830. Bering Sea to Panama. (C. dorsata Brod. of Carpenter). Type locality, Puget Sound, Washington.

Collecting data: This common species may be found on almost all rocky rubble reefs and such places as the San Pedro breakwater; also common commensal on other mollusks. Astraea undosa Wood is frequently covered with them. In dredging it is brought up from all depths to as deep or deeper than 50 fathoms. We have it in great numbers from off Monterey in 10 to 40 fms.; off Redondo Beach and Catalina Island in 25 and 35 fms.; very common on the dredged Kellettia kellettii Forbes from off Redondo Beach . It is a common species in some of the San Pedro Pleistocene deposits. (Burch).; Crescent City to Ensenada and the Coronado Islands (San Diego Museum); Port Orchard and Agate Pass, Puget Sound, Wash.; Drier Bay, Knight Island, Alaska,1923 on stones and dead shells (W.J. Eyerdam);

Crepidula con.

Subgenus Ianacus Morch,1852 Cat. Yoldi, p. 146. Type (by subsequent designation, Harris,1897): Crepidula plana Say. No description in original. Evidently intended for the thin, flat, white Crepidulas like our nummaria.

Crepidula crepidula (Linnaeus),1767. Linn. Syst. Nat. p. 1257, no. 752 (Ed. 12). Patella crepidula Linnaeus,1767.

And in connection with the above Crepidula unguiformis Lamarck,1818 Lam. An. sans Vert. VI, Pt. 2, p.25, No.4.

The above data is mentioned in order to make what may seem to many a facetious suggestion, and that is that insofar as the small white species are concerned we might do well to go back to Linnaeus and throw everything else in the synonymy down to date. Say, when he described C. plana, as well as most of the other authors have expressed doubt that their species is distinct. If anyone seriously thinks that he can take a mixed lot of these shells taken from the apertures of dead gastropods from literally all over the earth and separate them, I would be greatly interested in the method. There is some discussion by authors of the notch or lack of it, but I see the same deckand the same notch in all of them. Please understand that it is simply my personal opinion that this is but one world wide species, and that I am a minority opinion of one. Therefore, the approved nomenclature of the majority will follow. (Burch).

Crepidula nummaria Gould,1846. (C. navicelloides Nuttall). Plover Bay, Bering Strait to Panama. Type locality; Classet (Straits of Juan de Fuca).

The problem involved here is whether or not this is distinct from the small pure white species commonly found in the apertures of dead gastropods etc. The original description of nummaria specifically mentions a " thick yellowish eipdermis" which seems to be entirely absent from the other species which must correspond to the Atlantic C. plana Say. C. nivea C.B. Adams might cover the pure white species adequately if it is distinct. The majority of recent writers have been disposed to place nivea in the synonymy of nummaria . Mr. Allyn G. Smith first suggested that perhaps the heavy species commonly found under large stones in such localities as San Simeon, Cayucos etc. and also on such things as the San Pedro breakwater are nummaria, and that nivea is a distinct and good species.

Collecting data: Mr. A.G. Smith writes " We have not found this in Monterey Bay although it is found both northand south of this locality. Have never found this in pholad holes, have you ? The pholad hole species is perforans (= nivea C.B. Adams) in my opinion."

Crepidula nivea C.B. Adams,1852. Cat. of Shells collected at Panama, no. 351, p. 234. The original description follows:

" Shell ovate-eliptic: rather thick: within snow white: without dingy white,sometimes with a faint tinge of brown: very irregularly concentrically more or less wrinkled, with very distinct striae of growth: apex turned more or less to the right, moderately prominent, marginal: septum longitudinally subangular, with a deep sinus at the left and a shallow one at the right: margin thick, exhibiting striae of growth. It closely resembles C. unguiformis, but constrntly differs in characters and station. Length 1.4 inches; breadth 1 inch; height .4 inch.
Station- Under stones, near low water mark
Habitat- Panama
45 specimens collected on reef."

Mr. A.G. Smith advises on this species " Gordon and I put the following in synonymy; fimbriata Reeve, perforans Valenciennes (= exuviata Nuttall) on the basis that they are more situs forms. I have specimens in my collection from San Pedro that seem extremely close to the eastern C. plana Say."

Mr. E.P. Chace comments " I have smooth specimens of C. nivea from Pecten shells , Mugu Bay, that are anything but white- range from light brown to very dark brown all except the decks."

Miss Viola Bristol of the San Diego Museum reports " Dr. J.L. Baily says this is a synonym of C. squama Broderip,1834 and ours are so labelled." Specimens from Magdalena Bay to Panama.

However, the majority opinion at this time seems to be to use this name for our pure white species without epidermis commonly taken in the apertures of dead gastropods. Records usually read as follows: " from dead Thais shells at Monterey"; " from dead Tegula at San Simeon"; " from dead Bursa and Kelletia dredged in 25 fms. off Redondo Beach". This is a very common Pleistocene fossil in the Timm's Point and other San Pedro deposits, also Baldwin Hills Del Rey etc. (Burch); Port Armstrong, Baranof Island, ~~Crepidula~~ 1917; Port Orchard, Kitsap Co., Wash.; Ishut Bay, Afognak Island, Alaska,1922 (W.J. Eyerdam).

Crepidula nivea perforans Valenciennes,1846. (C. exuviata Nuttal Reeve,1859) Puget Sound to Panama. Type locality not given. Habitat in pholad holes. This is another subspecies described from a form caused by habitat. This entire group is disposed to vary to suit their location and naturally this suits itself to a pholad hole. I consider it of no consequence whether it is novea, nummaria or what. Have collected it in many localities: dredged in

(con.)

pieces of shale off Monterey in 10 fms.; Cayucos, Calif. in pholad holes in stones just off the townsite; White's Point, Los Angeles Co. in pholad holes in shale. (Burch); Kino Bay (Lowe); Montijo Bay (Lowe); La Jolla(Brier& Bristol
Crepidula fimbriata Reeve,1859. Vancouver, B.C. to Panama. Type locality, Vancouver Strait. This is another species to be placed in the synonymy by the consensus of opinion. Dr. A. Myra Keen comments " Seems unnecessary". Smithand Gordon place it in the synonymy. The San Diego Museum have sets labelled using it as a subspecies of nummaria. Mr. E.P. Chace comments " I have specimens from Panama that look exactly like the figure in Reeve Conch. Icon. An occasional specimen of - C. nivea or nummaria has a leaning toward it.

Crepidula glottidiarum Dall,1905. Santa Monica, Calif. to San Pedro on Glottidia albida Hinds. Type locality, San Pedro.

This species is usually considered a subspecies of nummaria. It may be. However, the statement that it is found only on Glottidia is incorrect. We have dredged it on stones off Redondo Beach in 25 fms. gravel,and it still retains its general shape and can be easily separated. Of course, it may be that after attaining a growth to the form on Glottidia these specimens were accidentally moved to the stones. One thing seems clear and that is that IF the two species discussed above, Nivea and nummaria are really two species, then glottidiarum should be a subspecies of nummaria rather than nivea because it does have a very definite yellow epidermis. Inasmuch as Glottidia albida is itself a very common dredged form all around Santa Monica Bay, this Crepidula is also more or less common. (Burch).
Mr. A.G. Smith suggests that it would be of value to study the anatomy of this species, radula etc. and compare with nivea and or nummaria.
Mr. E.P. Chace comments " My opinion is that it is a situs form. As you know almost any Crepidula will grow in almost any shape- especially true of C. nummaria and nivea." Reported from Treminal Island, San Pedro (Lowe) (Set in San Diego Museum).

* Continued discussion of Crepipatella from page 15.*

The following statement has been received from Dr. W.P. Woodring, United States Department of the Interior, Geological Survey, Washington,D.C.

" Crepipatella Lesson,1830, Voyage de la Coquille, Zoologie, vol.2, pt.1, p. 389. Type (designated by Gray,1847)- Calyptraea adolphei Lesson (= Crepidula dilatata Lamarck, fide Dall), Recent, Peru. The type species lacks pronounced sculpture, but the deck has a deep abapical indentation and a minor indentation and swelling near the middle. On account of the peculiar deck characters, I prefer giving generic rank to Crepipatella-. Verticumbo, which has the same deck characters, might be given subgeneric rank under Crepipatella, on account of the sculptured apex. I am, however, not recognizing it. Crepipatella charabdis is probably closely related to the unfigured Crepipatella orbiculata, which has no sculpture."

We are disposed to follow Dr. Woodring's suggestion and use Verticumbo as a subgenus of Crepipatella.

Subgenus Verticumbo Berry,1940. Bulletins of American Paleontology, vol. 25, no. 94A, p.7.
" Shell subcrepiduloid, but with an expansive, clearly spiral, excentric dextral shell, and a strongly excentric concave deck within." Type- V. charabdis Berry,1940.

(con.)

It seems from Dr. Woodrings conclusions that we must consider the species discussed on page 14, *Crepidula orbiculata* Dall,1919, a species of the genus *Crepipatella.*

Crepipatella (*Verticumbo) charybdis* (Berry),1940. Bulletins of *American Paleontology, vol. 25, no. 94A,* Paleontological Research Institution, Sept. 28,1940. pp 8-9, Pl. 1, figs. 6-10.

" Shell subcrepiduloid or haliotoid, rather thin, chalky, fragile, almost circular, moderately elevated; nucleus of about 1½ whorls, strongly spirally mammillate, excentric, posterior, the shell thence expanding rapidly to maturity ; highest at nucleus or just in front of it; exterior surface either unsculptured except for numerous growth lines of varying strength, or exhibiting a varying number 9 up to 15 or 16) of coarse, irregularly sinuous, radial (i.e spiral) ridges, running in general perpendicular to the tangent of the growth lines. Interior white to light-buff, polished, the short wide deck convex, strongly excentric, and covering perhaps a quarter of the main cavity." Measurements of holotype in mm.- Long. 8.7; lat. 9.2; alt. 3.6. Type locality- Lower Pleistocene, bluff in alley south of Second St. and east of Pacific St., San Pedro, Calif."

In the discussion following the description Dr. Berry states " *Crucibulum, Calyptraea* and *Crepidula* all exhibit certain points of similarity, *but the persistence to maturity of* an indisputable spiral shell, as well as the corresponding structure of the dockand interior cavity, separates it from each of these. To which of the genera mentioned it is most closely allied is thus not clearly apparent,and perhaps will not be unless and until its presence is revealed in the Recent fauna and an investigation can be made of the anatomy. That it should so come to light would surprise me not at all, although to date, I have not seen the species evenas a fossil in any later formations than those indicated. Considerable variation is evident in the shells in hand, all my larger shells from Timm's Point being smooth, but I feel that the sculptural differences noted are more likely to prove of situs than of race or even of the stage of maturity, although the latter consideration is of course not out of the question. The holotype is doubtless immature, but was selected because of the clear showing of some of the more trenchant characters."

Collecting data: Dredged Recent in 50 fathoms off Redondo Beach, Calif. on both sides of the submarine canyon; also very common in the Pleistocene of Timm's Point, San Pedro, Calif. This is a very distinctive species although at first glance reminding one of *Crepidula aculeata* (Gmelin). (Burch).

Additions and Corrections

Family Calyptraeidae

Genus Crucibulum Schumacher,1817. Type (? Monotypy): C. planum Schumacher = Patella auricula Gmelin. Dr. A. Myra Keen comments " I am in some doubt as to whether this is trully monotypy; Schumacher named two species as types of two sections, C. planum and C. rugoso-costatum, but according to Dillwyn, both names apply to the same biologic entity, an Antillean species."

" Differs from Calyptraea in the internal cup-shaped lamina, which is entire and attached along a line on one side to the inner wall of the shell." (Tryon).

The following list of species and notes are from Mr. A.M. Strong's notebook.

Genus Crucibulum Schumacher,1817.
Crucibulum spinosum (Sowerby),1824 Trinidad to Chile
Crucibulum imbricatum (Sowerby),1824 La Jolla to Chile
Crucibulum quirquinum Lesson,1830 Gulf of Calif. to Magellan Strait
Crucibulum pectinatum (Sowerby) Gulf of Calif. to Panama
Crucibulum umbrellum Deshayes,1830 Gulf of Calif. to Panama
Crucibulum trigonale Adams and Reeve,1850 Central America
Crucibulum radiatum Broderip,1834 Panama
Crucibulum serratum (Broderip), 1835 Peru
Genus Trochita Schumacher,1817.
Trochita radians Lamarck,1822 Gulf of Calif. to Panama
Trochita trochiformis Gmelin,1791 Panama to Peru
Trochita intermedia d'Orbigny,1841 Peru
Genus Cheilea
Cheilea cepacea (Broderip),1834 Gulf of Calif. to Panama (equestris L.)
Cheilea corrugata (Broderip) Gulf of Calif. to Peru
Genus Calyptraea Lamarck,1799
Calyptraea contorta Carpenter,1856 Catalina to Gulf of Calif.
Calyptraea mamillaris Broderip,1835 Magdalena Bay to Peru
Calyptraea conica Broderip,1834 Gulf of Calif. to Panama
Calyptraea subreflexa Carpenter,1855 Gulf of Calif.
Calyptraea lichen Broderip,1834 Ecuador
Calyptraea unguis Broderip South America

Crucibulum imbricatum Sowerby,1824. Tryon uses C. scutellatum Wood. This is from Wood's Index Test. Suppl. This should be credited in Hanley and dated 1828. Under this are placed C. dentatus Menke,1847; C. gemmacacum Val.; extinctorium Sby.;C. planatum Morch; C. rugosum Lesson;,1839 (not Desh.); Dall places C. auratum Reeve here but Tryon gives it from West Indies.

Crucibulum spinosum Sowerby,1824. Tryon calls this a variety and uses the name C. tuberiferum Lesson which should take the date 1830. Under this are placed C. pezizum Hanley(Wood),1828; C. hispidium Brod.,1834 and C. cinereum (Gray),1842.

Crucibulum quirquineum Lesson,1830. Tryon calls this a variety but Dall lists it as a distinct species. Carpenter says of this " The quirquina of Lesson and d'Orbigny belongs to a southern type which may be distinct; though it has characters enough in common to make it not impossible that it is a coarse variety. It is characterized by a more solid texture, light reddish brown color, entire absence of spines, and less angulated cup"

(con.)

Under this are placed C. tenuis Brod. (tenue); C. lignarium Brod., 1835; C. rugosum Desh. (not Lesson); C. ferrugineum Reeve, 1858; and C. spectrum Reeve, 1859. C. maculosum Brod., 1834 is placed here by Dall but under C. spinosum by Carpenter and Tryon. The same applies to C. striatum Brod. (not Say).

Crucibulum radiatum Broderip, 1834. Tryon gives this species as doubtful and Dall makes no mention of it. Carpenter says of it, " The C. radiata, in most respects agreeing with C. spinosa, differs in the remarkable flattening of the cup, and in its greater separation from the margin."

Crucibulum umbrellum Deshayes. Tryon places this under C. imbricatum Sby. Carpenter says of it, " This latter species (comparing with imbricatum) is generally longer, more spreading, of a lighter color, and with the cup only adhering close to the apex. The ribs are also less developed and never pitted." Carpenter says this equals C. rude (rudis) Brod., 1834.

Crucibulum trigonalis Adams and Reeve, 1850. Carpenter says of it. " China Seas. This scarcely differs in any essential particular from Crucibulum lignarium Brod. and its varieties from South America. The trigonal form may be an accident of growth."

Crucibulum pectinatum Carpenter, 1856. Carpenter places C. corrugatum Cpr. (not Brod.) and C. jewettii Cpr. h re. Dall and Tryon place these under C. imbricatum Sby. See Reeve, pl.3, fig.7 for description and figure.

Crucibulum serratum Broderip. Dall and Tryon place this under C. imbricatum Sowerby. Carpenter says of it " Like the young of C. pectinatum; nearly transparent; white with purple ray." See Reeve, pl.7, fig.21 for description and figure.

Trochita radians Lamarck, 1822. Of Trochita ventricosa Carpenter he states " It differs from the S. American T. radians and also from the Gulf species T. spirata, in the great convexity of the whorls, which are so produced at the shoulder that the sides form nearly a right angle." It seems probable that C. radians Lam. , C. spirata Forbes and C. ventricosa Carpenter are all one species. To these should be added Patella poculum (Wood) Hanley.

Trochita trochiformis Gmelin, 1791. As described by Dall this is a distinct and smaller South American species. Dall places under it C. araucana Less. C. dilata Sby. and C. sordida Brod. The last is said by Carpenter to be a Galerus.

Trochita intermedia d'Orbigny, 1841. Listed by Dall from Peru. No further references or a description found.

Cheilea equestris Linnaeus, 1758. Tryon and Dall both use the name of the West Indian species and place the West Coast C. cepacea Broderip, 1834 under it. Carpenter says of C. cepacea " This shell is easily distinguished from the West Indian species, C. equestris, etc. both by the vertex and the markings " A number of other names are listed but if described from the west coast the fact is not so stated.

Cheilea corrugata Broderip. Listed by Tryon and Dall as distinct. Seems to be distinguished by a coarser sculpture.
Calyptraea tortilis Reeve and Calyptraea alveolata Reeve from the Galapagos are listed as questionable species of Cheilea.

Calyptraea fastigiata Gould,1846. Seems to be a distinct Puget Sound species as listed by Dall.
Calyptraea contorta Carpenter,1856. Seems to be a distinct Southern Calif. species as listed by Dall.
Calyptraea mamillaris Broderip,1834. This is C. regularis C.B. Adams and C. lamarckii Mke. (not Desh) according to Carpenter. Carpenter distinguishes the species mainly by the nuclear whorls which are " generally rather separated fromthe shell, and of an elegant discoidal shape like Planorbis, displaying the whorlsand the sunken apex." Tryon places everything from the coast under this species.
Calyptraea conica Broderip,1834. This is C. aspera C.B. Adams and of Reeve according to Carpenter. Carpenter says of the nucleus, " the vertex in this species is generally eroded, butm, when perfect, about .02 across, not prominent, with the outer whorl enveloping the rest, apex not visable."
Calyptraea subreflexa Carpenter,1855. See Tryon and Reeve for description.
Calyptraea lichen Broderip,1834. Dall recognized this as distinct in Peruvian Fauna. Carpenter says in speaking of C. mamillaris in Mus. Cumings " Some of these as well as C. lichen, closely resemble the young of C. conica A microscopic examination of the nuclear vertices would probably decide the question."
Calyptraea unguis Broderip. Carpenter says, " The C. mamillaris of d'Orb. is the C. unguis of Brod. and appears a distinct species, of which C. sordida Brod. is probably a variety; the laminae being so much reflexed as to pass into Crucibulum, the young of which however it does not resemble at all." There seems to be no further records of this species which is left of uncertain standing.

Genus Crucibulum Schumacher,1817.
Crucibulum spinosum (Sowerby),1824. Trinidad, California to Tome,Chile and the Galapagos Islands. Type locality not given.

Collecting data: A very common species in great abundance in certain localities. Newport Bay on dead valves of Pecten and Ostrea; very common all around Mission Bay,San Diego Co. especially on dead valves of Ostrea; dredged off Malaga Cove in 10 to 15 fathoms on gravel and shell, and these specimens are slightly different from the typical bay form; common on dead shell in the Estero de Punta Banda, L.C. An interesting note on these was the large percentage of albinos among them, many of them almost pure white but otherwise perfect living specimens. (Burch); San Felipe, Gulf of Calif. (Earl Huffman); Guaymas,Sonora, Mexico (Mrs. A. Stahman); Gulfo de Nicoya (M. Valerio); Panama, Taboga Island (Baker- Zetek); Scammons Lagoon (Dr. F. Baker); Guaymas,Mex. (W.J. Bower); Mr. A.G. Smith writes " Willard M. Wood reported taking 9 specimens at Monterey in 1893, but none have been reported from there since. The record is doubtful until confirmed." The same would apply to the Trinidad record.

Crucibulum imbricatum (Sowerby),1824. This is a species of the southern fauna as discussed above and not of California. Dr. Joshua L. Baily Jr. explains the origin of the California record of La Jolla in a recent letter " Crucibulum imbricatum from La Jolla. If you base this record on my note in the Nautilus you had best discard it. I was only 14 years old when I found that specimen and didn't know what C. imbricatum really was. Also, I didn't get it at La Jolla, but at Pacific Beach. This opportunity to correct an error is welcome, and I hope you will publish my retraction of this misstatement."

Collecting data: W.J. Eyerdam reports taking this species from Mazatlan, Gulf of Fonseca,Honduras,Corinto,Nicaragua and Talara,Peru. and C. spinosum from Mazatlan,Gulf of Fonseca,Honduras,La Union,Salvador,Corinto,Costa Rica.

Genus Calyptraea Lamarck,1799. Type (by monotypy), Patella chilensis L. " Shell oval, limpet-like; with a posterior, oblique, marginal apex; interior polished, with a shelly partition covering its posterior half." (Woodward).

Calyptraea fastigiata Gould,1856. Port Etches, Alaska to Redondo Beach, Calif. (Burch). Type locality, Puget Sound.

Grant and Gale place this in the synorymy of C. mamillaris Broderip, 1834. The general idea seems to be that fastigiata is strictly a northern species ranging no farther south than Puget Sound whereas mamillaris is a southern species ranging not as far northas San Diego. All in between must therefore be C. contorta. There is a great deal of confusion about the species under this genus.

Mr. George Willett in Trans. San Diego Soc. Nat. Hist.,1937, vol.8, no. 30, states " .... C. contorta may be a stunted, southern form of fastigiata, but both differ from mamillaris of southern waters in their thinner shell."

However, we have been disposed to think that we have been getting two distinct species of Calyptraea off Redondo Beach- the small C. contorta Cpr . in great abundance from the comparatively shallow gravel beds ranging from 15 to 30 fathoms and what we considered the northern C. fastigiata in from 50 to 75 fathoms.

We also dredged another lot fromthe shale off Monterey which we understand may be a new species. They are being considered by Mr. Allyn Smith and Mackenzie Gordon.

Collecting data: Dredged off Redondo Beach in 50 and 75 fathoms gravel bottom (Burch); Point No Point, San Juan Islands, Washington in rock and shell bottom (Miss R.E. Coats); dredged in Puget Sound (T. Kincaid); Puget Sound (Randolph); Orcas Id., P.S. in 10 to 30 fms. (Dr. F. Baker); San Juan Islands (Lowe)(San Diego Museum); Puget Sound, San Juan Islands; Izhut Bay, Afognak Island and Drier Bay, Knight Island, Alaska- dreged- (W.J. Eyerdam).

Mr. A.G. Smith writes " Have seen no undoubted specimens from Monterey, although reported from there by Cooper. "

Calyptraea contorta Carpenter,1865. Monterey, Calif. to Gulf of Calif. Type locality: This has been generally published as Monterey but Dr. A. Myra Keen advises that it is Catalina Island, Calif. from the holotype label in the U.S.N.M.

Collecting data: As stated above under discussion of fastigiata, we have found this small species extremely abundant usually attached to pieces of shell or small gravel off Malaga Cove in 15 fms.; Redondo Beach in 25 fms/; Point Vicente in 20 fms.; Avalon,Catalina Island in 25 fms/; off Santa Cruz Island in 50 fms. (Burch). Of course, it is quite possible that we have a single species with the specimens from deeper water and naturally colder water attaining much greater size. The principle difference seems to be that the deeper specimens are simply much larger and much lower spired. (Burch). Monterey Bay in 15 to 40 fms. This is a good species of small size (A. Smith); S. Coronado Island (Dr. F. Baker); San Felipe, Gulf of Calif. (Frank Stephens); San Diego (Gripp); San Pedro (Lowe) (San Diego Museum).

Family Naticidae

The following keys and lists are from Mr. A.M. Strong's notebook.

Shell porcelanous, thick or fairly so
• Operculum shelly .... Natica
• Operculum horny ....Polinices
Shell thin, more or less pellucid
• Shell oval or oblong ....Eunaticina
• Shell depressed, aperture ear-shaped .... Sinum
Shell minute, spire elevated .... Elachisina

Genus Natica

Umbilicus closed by a solid callous pad
• Shell uniformly white
Height 20 mm. Bering Sea to San Diego ....clausa
• Shell yellowish white, faintly banded
Height 14 mm. Esteros Bay to Gulf of Calif. .... salimba
Umbilicus more or less open
• Shell obliquely depressed
•• Whitish, closely longitudinally lined with chestnut
Diam. 35 mm. Lower Calif. to Ecuador .... elenae
• Shell oblong or globose
•• Surface with fine axial or spiral striations only
••• Brownish, a white band on upper part of whorls
Height 20 mm. Gulf of Calif. to Peru .... unifasciata
••• Yellowish brown, without color markings in the adult
Height 20 mm. Bay of Panama .... othello
••• Peru .... undata
• Entire surface with axial plications
•• Fawn color, with 3 articulated dark chestnut bands
Gulf of Calif. to Ecuador .... broderipiana
• Axial plications between shoulder and suture only
•• Fawn color, with 3 mottled white bands
Height 18 mm. Gulf of Calif. to Panama .... catenata
•• Pale brown, with 3 obscure pale bands
Height 17 mm. Bay of Panama .... scethra

Genus Polinices

Umbilicus more or less filled with callus
• Shell depressed
•• Whitish or broadly chestnut banded
Diam. 50 mm. Lower Calif. to Peru .... glauca
•• Milk white, with obsolete spiral lines
Diam. 9 mm. Galapagos ....littorinus
• Shell oval to globose
•• Whorls flattened
••• With an orange colored subsutural band
Height 35 mm. Lower Calif. to Peru .... otis
••• Unicolor, not banded
•••• Umbilical callus white
Height 75 mm. Crescent City to Chile .... recluziana
•••• Umbilical callus purplish brown
Height 40 mm. Monterey to Newport Bay .... alta
•• Whorls quadrangularly compressed at the sides
Height 50 mm. Panama ....panamensis

(con.)

.. Whorls rounded, convex
... Umbilical callus purplish
.... Shell pyriformly ovate, white, solid
Height 35 mm. Gulf of Calif. .... unimaculata
.... Shell ovately globose, bluish or bluish white
Height 35 mm. Galapagos to Peru .... atracyansis
... Umbilical callus white
.... Shell oblong turbinate, white,solid
Height 35 mm. Gulf of Calif. to Peru .... uber
.... Similar but with a persistant epidermis
Galapagos to Peru ....philippianus
.... Shell ovate, body whorl slopingly shouldered
Pwru .... alveatus
.... Shell rounded, ellipsoid, dirty milk white
Height 12.5 mm. Alaska to San Diego .... caurinus
.... Shell globose
..... Shell large, thick and heavy
Peruand Chile .... dubia
..... Shell small, rather thin
...... Shell polished, white
Height 12 mm. Chile .... strebeli
...... Epidermis minutely spirally banded
Height 16 mm. Monterey to Coronado Islands......acosmitus
Umbilicus without an entering callus
. Umbilicus large, funnel shaped or cylindrical
.. Whorls with a flattened band at the posterior third
Height 100 mm. British Columbia to Newport Bay ..... lewisii
.. Whorls obliquely flattened below the sutures
Height 28 mm. Ecuador to Peru .... ravida
.. Whorls flat topped, translucent white
Height 26 mm. Panama to Peru ....agujanus
.. Whorls rounded,convex
... With faint indications of spiral threads
Height 50 mm. Alaska to Laguna .... draconis
... Surface smooth, white
Height 22 mm. Magellan Straits .... vaginatus
. Umbilicus narrow
.. Shell brownish, with x 2 narrow white spiral bands
Hight 45 mm. Cape San Lucas to Acapulco .... bifasciata
.. Shell transparent white, flesh tinged
Height 13 mm. Galapagos .... glabella
.. Shell uniformly white
... Body whorl slightly elongated, wrinkled at suture
Height 15 mm. Panama and Galapagos ,,,,,,,,,,,,crawfordianus
... Whorls slightly flattened below the suture
Height 6 mm. Chile .... pisiformis
... Whorls constricted in front of sutures
Height 20 mm. Magellan Strait ....constrictus
... Whorls depressed, milk white /pa
Diam. 14 mm. Panama and Galapgos .... pedroanus
... Whorls evenly rounded, convex
.... Surface smooth, polished
Height 17 mm. Peru and Chile .... solutus
.... Upper half of whorls axially wrinkled
Height 8 mm. Alaska to San Diego .... canonicua
.. Shell large, white, with distant dark markings
Height 50 mm. Galapagos ....macrostoma

Genus Eunaticina

Sculptured with extremely fine wavy spiral striae
Height 35 mm. Oregon Coast to San Diego .... oldroydii

Genus Sinum

Adult shell over 20 mm. in diameter
. Shell white or waxen, inside and out
Diam. 38 mm. Monterey to Todos Santos Bay .... californicum
. Inside of shell brownish
.. Shell very flat, with a minute flattened apex
Diam. 25 mm. Catalina to Gulf of California .... debile
.. Shell moderately elevated
Diam. 50 mm. Panama to Peru ....concavum
Adult shell less than 10 mm. in diameter
. White, sculptured with sharp spiral grooves- shell suborbicular
Diam. 6.5 Catalina .... keratium
. Grayish white, sculpture microscopic- shell depressed
Diam. 9 mm. Catalina to Panama ....pazianum

Genus Elachasina

Sculptured with fine, uniform striae
Height 3 mm. San Diego .... grippi

Genus Natica Scopoli,1777.

Natica (Cryptonatica) salimba Dall,1919. Esteros Bay to Gulf of Calif.
Natica (Cryptonatica) clausa Brod. & Sby., 1829. Bering Sea to San Diego
Natica chemnitzii Pfeffer Gulf of Calif. to Peru
var. unifasciata Lamarck
Natica broderipiana Recluz,1847 Cerros Isl.,Gulf of Calif. to Ecuador
Natica catenata Philippi,1851 Gulf of Calif. to Ecuador
Natica elenae Recluz,1843 Lower Calif. to Ecuador
Natica idiopoma Pilsbry & Lowe,1932 Nicaragua
Natica undata Philippi,1852 Peru
N. (Cochilis) othello Dall,1908. Bay of Panama
N.(Cochilis) seethra Dall,1908. Bay of Panama
Natica colima Strong and Hertlain,1937. West Mexico

Genus Polinices

P.(Euspira) pallidus (Brod. & Sby.),1829. Arctic Sea to Cortez Bank
P. (Euspira) lewisii (Gould),1847. British Columbia to San Pedro
P. (Euspira) caurinus (Gould),1847 Puget Sound to San Biego
P. (Euspira) draconis Dall,1903. Alaska to Laguna
P. (Euspira) acosmitus Dall,1919 Monterey to Coronado Islands
P. (Euspira) canonicus Dall,1919. Alaska to San Diego
P. (Euspira) agujanus Dall,1908 Panama to Peru
P. (Euspira) pardoanus Dall,1908. Panama and Galapagos
P. (Euspira) litorinus Dall,1908 Galapagos
P.(Euspira) crawfordianus Dall,1908. Panama and Galapagos
P. (Euspira) solutus (Gould),1847 Peru and Chile
P. (Euspira) pisiformis (Recluz),1843 Chile
P. (Euspira) strobeli Dall,1908 Chile
P. (Euspira) constrictus Dall Magellan Straits
P.(Neverita) recluzianus (Deshayes),1839 Crescent City to Chile
P. (Neverita) alta Dall Monterey to Newport Bay
P. (Neverita) glauca (Lesson),1826 Lower Calif. to Peru
Polinices otis Broderipand Sowerby,1829 Lower Calif. to Peru

(con.)

Polinices uber Valenciennes,1833	Gulf of Calif. to Peru
Polinices intermorata Philippi,1857	Gulf of Calif. to Panama
Polinices bifasciata (Gray)	Gulf of Calif. to Acapulco
Polinices unimaculatus Reeve	Gulf of Calif.
Polinices panamensis (Recluz),1843	Panama
Polinices philippianus (Nyst),1845	Galapagosand Chile
Polinices ravidus (Eydoux & Souleyet),1852	Ecuador to Peru
Polinices alveatus (Trochel),1852	Peru
Polinices dubius (Recluz),1843	Peruand Chile
Polinices rupulumlima Pilsbry,1933	Panama
Polinices macrostoma (Philippi),1852	Nicaragua and Galapagos
Polinices glabella (Reeve),1855	Nicaragua and Galapagos
Polinices cricknagi Palmer and Hertlein	Galapagos

Genus Eunaticina Fischer,1855

Eunaticina oldroydii Dall,1897	Oregon to San Diego
Eunaticina heimi Hordan,1936	Galapagos

Genus Sinum Roeding,1798.

Sinum californicum Oldroyd,1917.	Monterey to Todos Santos Bay
Sinum debile Gould,1852	Catalina to Gulf of Calif.
Sinum pazianus Dall,1919	Catalina to Panama
Sinum keratium Dall,1919	Catalina
Sinum concavum (Lamarck),1822	Panama and Chile
Sinum noyesii Dall	Nicaragua to Panama
Sinum sanctijohannis Pilsbry & Lowe,1932	Nicaragua

Genus Elachisina Dall,1918.

Elachisina grippi Dall,1918.	San Diego

Family Naticidae

Genus Natica Scopoli,1777. Type (by subsequent designation, Harris, 1897), Nerita vitellus Linnaeus (Natica rufa Born of authors). fide Woodring,1928, p. 377.

" Shell oval globular, porcellanoud,solid,generally smooth, covered by a fine epidermis, which is transparent, and generally not very persistent; umbilicated, or umbilicus more or less filled with callus; aperture semilunar, vertical, the outer lip simple. Operculum large, semilunar,paucispiral, corneous or calcareous." (Tryon, Manual of Conchology).

Subgenus Natica s.s. Not represented north of San Diego- N. unifasciata Lamarck.

Subgenus Tectonatica Sacco,1890. Type (by monotypy), Natica tectula Bonelli.

" Shell globose; umbilicus entirely filled with a callus deposit; operculum externally smooth".

* Note- Dr. Dall placed them all under Cryptonatica Dall,1892.

Natica clausa Broderip and Sowerby,1829. Arctic and Bering Seas, south in gradually deepening water, to Japan on the west and San Diego, Calif. on the east. (Dall). Type locality not given. Johnson gives the Atlantic range " Labrador to off North Carolina in 16-1537 fathoms."

Collecting data: San Nicholas Island (Lowe); Bear Bay, Peril Straits,

(con.).

Alaska (Kate Stephens); Port Graham,Alaska (Baker); Spitzbergen and Tronso, Norway (Capt. Andrews) (San Diego Museum); Monterey Bay, 389-871 fms. (U.S.F.C.) (A. Smith); W.J. Eyerdam reports from the following stations, Puget Sound, Wash.; Kola Fjord,Russia,1928; Izhut Bay, Afognak Id., Alaska, 1922; Drier Bay, Knight Island,1923; Sitkalidak Island, Kodiak Islands; Raspberry Id.; Hinchinbrook Id., Pr. Wm. Sound; Unalaska Island,Aleutians; Unimak Id.; Akutan; Atka; Ugamik Bay, Kodiak Ids.; Uyah; Tromsodund,Norway (Norberg); Gulf of Kronotski,Kamchatka; Tsuruga Bay, Japan; Mr. Eyerdam comments on the species as follows: " The specimens from N. Europe are mostly what we have been calling N. russa. The northern race should retain the name of aleutica at least as a subspecies because it grows so much larger. I have specimens taken alive that I collected at Unimak Island 2½ inches high. The specimens from Iceland are like some of the small forms of Natica aleutica from Izhut Bay and Ugamik Bay. Those from Kola Fjord, Russia and Tromso Fjord, Norway are the small brown, rusty colored form that we generally call russa, but may be the more typical European Natica clausa inasmuch that the different lots have been classified by that name by four of the best authorities on N. European marine shells, namely Odhner of Riksmuseum,Stockholm, Hindholm, the late director of the Academy of Science, Leningrad, Hans Schlesch of Copenhagen and Soot-ryen, director of Tromso Museum, Norway. The specimens that I collected in Tsuruga Bay, Japan, merge into Natica ianthostoma but lack the violet color inside the aperture. I am still at a loss as to what is really Natica clausa as it is also closely related to several other so called species. If any competent member of the shell club wishes to make a more thorough investigation of the status of N. clausa and desires to use my rather large series I shall be glad to loan them.

Natica russa Gould,1859. Bering Strait to Forrester Island, Alaska. to Puget Sound (Dall).

There has been no end of confusion about the above two species. Mr. Willett was of the opinion that many recorfs of clausa should be for russa. Dr. A. Myra Keen in Abridged Check List confines the range of clausa to the north and gives the range of russa south to San Diego. Grant and Gale state of russa " ... attains a larger size than Natica clausa. It also has a distinctive brownish color and a larger callus plug than Broderip and Sowerby's species with which it has undoubtedly been confused. Mr. Willett of the Los Angeles Museum has a series of N. russa which well illustrates the uselessness of the name aleutica."

However, I have a large set labelled N. aleutica Dall,1919 collected by Mr. Eyerdam from Unimak Island, Aleutian Islands and they certainly seem different to me from the shells I have as russa. I have large sets of clausa from the Atlantic and nothing else I have looks like they do. And Mr. Willett personally identified some specimens from the Pleistocene of Timm's Point as russa that certainly could never be connected with the shells above mentioned labelled aleutica. (Burch).

Dr. A. Myra Keen writes (Per. Comm. Nov. 1945) " Some years ago I sent Mr. Willett my only duplicate print of a National Museum photograph of Natica russa Gould. In his next letter he commented that this was not the shell he had been calling russa, that it was something he had never seen before, and that he would recommend the adoption of aleutica again. Perhaps Dr. Hill can locate this print for you. * Note* We will run a photo of this print on one of our forthcoming plates.*

Concerning this shell I made the following notes at the National Museum. " Natica Russa Gould. No. 188401, Jeffreys Collection , U.S.N.M. The holotype is lost; this specimen is a topotype collected by Stimpson in Behring's Straits and sent by Gould to Jeffreys. Dr. Dall(s discussion (Proc. U.S.N.M

(con.)

56, p. 352) might be construed as designation of the specimen as neotype. At any rate it is definitely not the russa of West Coast collections. The specimen is very thin, with wavy concentric striation. The aperture is high and narrow, the umbilicus closed. The operculum is calcareous, not polished or shiny on the exterior face."

Natica aleutica Dall,1919. North end of Nunivak Island, Bering Sea; south on the west from Kamchatka to Japan; on the east to the Aleutian chain and Puegt Sound. (Dall). Type locality, Unalaska,Aleutian Islands.

See discussions under N. clausa and N. russa. The final consensus of opinion is that this is a good species. Figures will appear on one of our plates in the near future.

Natica affinis Gmelin,1792. Arctic Ocean north of Bering Strait. Also Greenland.

Dr. A. Myra Keen advises on this species and the next as follows (Per. Comm. Nov. 1945) " I omitted N. affinis and janthostoma because they are outside our area. The " an bujus tribus" is a misprint for " an hujus tribus" and should have been left out of the locality description by Mrs. Oldroyd, as it is Gmelin's comment on systematic position of the species; he says in effect that he does not know its affinities."

Natica janthostoma Deshayes,1841. Commander Islands, Bering Sea; Kamchatka and south to Japan. (Dall). Type locality, Kamchatka. Figured in Bull. 112.

Collecting data: Sets in the San Diego Museum of Natural History from Japan and Notoro Bay, Hokkaido from Dr. Fred Baker; Mr. W.J. Eyerdam writes " I have collected this species in the Gulf of Kronotski, and at the mouth of the Kamchatka river, Kamchatka, also Attu Island, Bering Island and in Tsuruga Bay, Japan. It has a deep violet coloring in the aperture and the umbilicus has a curved slit while in N. aleutica or N. clausa it is closed. There is no readon for skipping this one as it is a distinct species. "

Natica salimba Dall,1919. Off Esteros Bay, California, and south to the Gulf of California in deep water. (Dall).
Type locality, between Santa Barbara and San Nicholas Island, Calif. in 216-339 fms.

Collecting data: Off Redondo Beach, Calif. in 100 fms. mud bottom.(Burch). Catalina Island in 30 fms. (Lowe).

Natica sp. Off Redondo Beach, Calif. in 150 fathoms. (Burch).

Genus Polinices Montfort,1810. Type (by original designation), Polinices albus Montfort (= Helix mamillaris Linnaeus,1767).

" Shell oval or suboval, solid, smooth, spire short, sharp; aperture semicircular, inner lip oblique, callous, the callus extending into the umbilicus. Operculum corneous. Color usually white, sometimes colored but not banded or spotted." (Tryon, Manual of Conchology).

Subgenus Euspira Agassiz in Sowerby,1838. Type (by subsequent designation, Dall,1908,1909), Natica glaucinoides Sowerby, not Deshayes (= Natica labellata Lamarck). (fide Grant and Gale, p. 803).

" Shell globose; spire moderate; outer lip straight, slightly retracted to suture, inclined about 30 degrees from vertical; inner margin with light callus on parietal wall; umbilicus open and without any funicle; operculum horny." (Marwick).

Polinices pallidus Broderip and Sowerby,1829. Arctic Ocean at Point Barrow and southward on the east to Forrester Island, Alaska. On the west at the Island of Kolguief in the Polar Sea and in the Okhotsk Sea.(Middendorff) south to Redondo Beach, Calif. in 100 fathoms. (Burch).

Collecting data: The specimens we dredged off Redondo Beach in 100 to 150 fathoms were identified as this species by Mr. George Willett who had collected it extensively in the north. (Burch); Izhut Bay, Afognak Id.; Friday Harbor, San Juan Islands, Wash.; Tromso,Norway; Hinchinbrook Id., Pr. Wm. Sound, Alaska (W.J. Eyerdam); Orcas Island, Puget Sound in 10 to 30 fms. (Dr. F. Baker); Ellamar Island, Alaska (Dr. Baker); San Juan Islands (Oldroyd); Katz Is.,Cape Espenberg,Alaska (Lowe); Forrester Island,Alaska (Willett).

Type locality on advice of Dr. A. Myra Keen is Icy Cape.

Polinices gronlandica (Beck) Moller,1842. Arctic Seas southward in gradually deeper water to Monterey, Calif. Also Greenland.
Type locality, Greenland.

Collecting data: Petersburg,Alaska (George Willett); Izhut Bay, Afognak Id., Alaska,1922; Victoria,B.C. (Eyerdam); Point Barrow, Alaska (Brower) Wrangell,Alaska in 50 fms. (Willett); Dogger Beach, North Sea; Sweddn; (Nat Hist. Mus. of San Diego); 296 fms. off Pt. Ano Nuevo,121-766 off Pt.Pinos(USFC

Polinices acosmitus Dall,1919. Monterey to Coronado Islands in deep water.
Type locality, off Monterey Bay, Calif.

Collecting data: Dredged off Redondo Beach, Calif. in 100 fms. mud bottom (Burch); 627 fms. off Pt. Pinos (USFC) (A. Smith);

Polinices monterona Dall,1919. Arctic Ocean, Bering Sea, and the Aleutians.
Type locality, Captain's Bay, Unalaska in 75 fms. / to Drier Bay, Pr. Wm. Sound, Alaska,1923 (Eyerdam).

Polinices algidus Gould,1848. Coal Harbor, Shumagin Islands, Alaska to Puget Sound. Type locality " Rio Negro" (Gould).

Polinices politianus Dall,1919. Petrel Bank, Bering Sea.
Type locality, in 600 fathoms.

Polinices caurinus Gould,1847. Norton Sound, Alaska to Puget Sound, and in deep water (822 fathoms) to San Diego, Calif.
Type locality, Straits of Juan de Fuca. Monterey Bay in 278-581 fms. (USFC)

Polinices canonicus Dall,1919. Off Alaska Oeninsula in 1,365 fathoms and off San Diego, Calif. in 822 fathoms. (Dall).
Type locality, off San Diego in 822 fathoms.

Polinices lewisii (Gould),1847. Duncan Bay, British Columbia to Todos Santos Bay, L.C. (Burch). Type locality, Puget Sound.

Collecting data: This abundant species found in our experience in every estuary on the coast. They are particularly abundant during the summer months. It seems odd that all of the published records for the range should stop at San Diego or even farther north when Todos Santos Bay, L.C. abounded with them. We even picked up a number in our dredged off Ensenada,Mex. in 10 to 15 fms. The bathymetric range is not great but they seem to be common enough down to 25 fms. or a little deeper off Monterey, Pacific Grove, Redondo Beach, Catalina Island etc. One item of possible interest is that only by dredging in our experience do you get the very young. We have series of them from the size of a sugar bowl down to the size of a pin head all off Redondo Beach.

The very young give some study when first seen. Not uncommon in the San Pedro Pleistocene.(Burch); " This is the largest species in the world of the family Naticidae and seems to reach its maximum size in Puget Sound where it is very common. Although its sand collar egg cases are very common on the mud flats I have never seen any of the very young. This species reaches a maximum height of 5 inches." (W.J. Eyerdam); San Quintin,L.C. (Fortiner); Scammons Lagoon (Capt. Porter); Mission Bay (E.N. Wilson); Olympia,Wash. (Hemphill); Del Mar (Bristol); Monterey 0 to 25 fms. (A.G. Smith).

Polinices draconis Dall,1903. Port Althorp, Alaska to Todos Santos Bay,L.C. Type locality, Drakes Bay, Calif.

Collecting data: In our experience this is a much rarer species than lewisii. It seems to be almost entirely a deeper water species. We have dredged it off Monterey; off Redondo Beach in 25 fms.; off Avalon,Catalina Island in 25 fms.; off Ensenada,Mex. in 15 fms. The fun commences with sorting out a box of the very young of this species and lewisii mixed. Separation of the adults is a simple matter but their young are amazingly alike. It can be done though.(Burch); Newport (Lowe); Del Rey (Lowe); Drakes Bay and also Catalina Island (Lowe); 12 to 50 fms. in Monterey Bay (A.G. Smith).

Polinices uber Valenciennes,1833. Mission Bay, Calif. south to Peru.

Dr. Joshua L. Baily Jr. adds this southern species to the California fauna (Per. Comm., Nov.,1945) " Polinices uber has been found in False Bay. Maxwell Smith has a specimen- also Miss Mary Williams got one. Her collection I believe is at Pomona College."

This species is possibly in the subgenus Polinices s.s.

Subgenus Neverita Risso,1826. Type (by monotypy), Neverita josephina Risso.

" Shell ovate; sutures tangenital, appressed; apertural callus thick, coalescing with a huge funicle, which fills the umbilicus; aperture greatly inclined." (Marwick).

Polinices recluzianus (Deshayes),1839. Crescent City, Calif. south to Tres Marias Islands, Mexico. Type locality, Mers de Californie.

Reference: Pilsbry, H.A., " Neverita reclusiana (Desh.) and its Allies", Nautilus 42:109-113, pl. 6, figs. 1-9, April,1929.

Dr. Pilsbry discusses this group very thoroughly and figures them well. In this paper he suggested a new subgenus or section of Neverita to be called Glossaulax, with recluzianus as type.

Collecting data: The common typical form of this species needs no discussion. It is found in all estuaries in southern California as well as the open coast. We have dredged it in as deep as 25 fms. but it is not a deep water species. (Burch).

Mr. A.G. Smith comments on the published ranges of this species and the following " We have not found it at Monterey and would be inclined to look with considerable suspicion on all records north of Pt. Conception, as this is a warm water shell". * Mr. Smith's observation coincides both with our experience as well as with all of the collecting records submitted.

Polinices recluzianus imperforatus ' Stearns' Dall,1909. Crescent City to San Diego.

The original description of this subspecies as reprinted in Oldroyd is so inadequate that it is impossible to figure out exactly what it is. Dr. Pilsbry in the paper mentioned above discusses it as follows: " In shape

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the shell is smaller and generally more depressed than recluziana, but it varies to forms equally high. The parietal and umbilical callus is white, or there may be a faint brown tint toward the outer margin; old ones have a brown streak on the callus contiguous to the posterior part of the outer lip. The callus covers the umbilicus typically, a s ig fig.4, but in some samples the closure is not complete, a small shallow or deep pit being left open. The shell is smaller than recluziana, the diameter usually 30-40 mm., but sometimes it reaches a larger size. Some apparently adult shells are much smaller, down to about 20 mm. diameter. " The Pleistocene specimen figured by Arnold and those sent by Woodring from Pacific and Oliver Sts., San Pedro, are small and agree with the living shells from Newport."

It seems to be the opinion of the majority of west coast collectors that this variety is of little consequence,and we have been placing all such specimens in the synonymy of the typical.

Polinices altus Arnold,1903. " The Paleontology and Stratigraphy of the Marine Pliocene and Pleistocene of San Pedro, Calif.", Arnold, Ralph, Stanford University,1903, p. 315.

Range: Monterey to San Diego.

Arnold merely mentions that Dall had described such a form. He does not say where or when. Dall in 1909 in U.S. Geol. Survey, Prof. Paper 59, p. 88, gives a brief description and this reference has been generally used and is reprinted by Mrs. Oldroyd.

Dr. Pilsbry at the suggestion of H.N. Lowe in the paper referred to above in the Nautilus considers alta a distinct species and not a subspecies. He discusses it at length and figures it. He says of it in part " In the Recent specimens the umbilicus varies in size but is always partially open and deep. The umbilical callus is brown (rarely pure white). The callus in some specimens, such as those figured from Newport, pl. 6, figs. 5,6, is long and tongue shaped at the end. In others, pl.6, figs. 7,8,9, Alamitos Bay, it has the usual shape of N. recluziana. Such variations are seen in our eastern N. duplicata...."

Collecting data: There are times when this form seems to come into the estuaries from deeper water. We have seen, for example Mugu Bay, Ventura Co. when all specimens collected were altus. Our experience has been not to find altus and typical recluzianus together to any extent. They are easily separable and in my opinion altus is a good name, but whether or not it is a species or a subspecies I do not know. I have seen no obvious intergrades. (Burch); San Diego Bay (Baker and Emery); Mugu Bay (Lowe); San Pedro and Long Beach (Lowe); Newport Bay and Morro Bay (Lowe); Ensenada (Lowe); Redondo (Tremper) (San Diego Museum).

Dr. Joshua L. Baily Jr. comments on the above species as follows (Per. Comm., Nov. 1945) " The two varieties of P. recluziana,alta and imperforata suggest a peculiar problem. Alta is distinguished by an elevated spire, imperforata by a large callus which completely fills the umbilicus. What should we call a specimen that has both an elevated spire and a completely filled umbilicus ? Since alta is now generally considered a good species and imperforata is not considered even a good variety, such a form as I have hypothecated would be considered a variety of alta. But if alta and imperforata had happened to be varieties of equal rank, my hypothetical form (which apparently does'nt exist) would have to be given a new varietal name, or else be considered to belong simultaneously to two varieties. And whenever two varieties based on independent characteristics are assigned to the same species, a potential third variety is implied. If three such varieties are assigned to the same species, there are four potential varieties, and in general, if n independent varieties are assigned to the same species the num-

-ber of hypothetical postulated varieties is given by the formula 2 n _(n-1) When a large number of varieties are assigned to a single species collectors ought to be on the lookout for these hypothetical forms. If they do not occur with reasonable frequency a problem for the geneticist is indicated."

Subgenus Polinices s.s.

Polinices nanus (Moller),1842. Arctic Ocean to the Aleutians and southward in gradually deeper water to near San Diego, Calif. (640 fathoms). Also Greenland.

There is a set in the San Diego Museum of Natural History from Aberdeen, Scotland in the Dr. F. Baker Collection.

Genus Sinum Roeding,1798. Type (by subsequent designation,Dall,1915) Helix haliotoides Linnaeus.

" Shell ear-shaped or naticoid, spire small, low; body whorl rapidly enlarging, with a very large aperture; sculpture consisting of fine revolving grooves, sometimes crossed by curved growth lines; operculum small, horny, subspiral."

Sinum scopulosum (Conrad),1849. U.S. Expl. Expd. Geol. p. 727, pl.19, figs 6,6a only,1849. (Sinum californicum Oldroyd,1917).
Range: Monterey to Todos Santos Bay. Type locality: Miocene of Astoria, Oregon. Type locality of S. californicum is San Pedro.

Collecting data: Mugu, Ventura Co.,Calif.; Newport Bay; Estero de Todos Santos Bay, L.C.; Mission Bay, San Diego Co. (Burch); Monterey (Mrs. Fackenthall) (A.G. Smith).

Sinum debile (Gould),1853. Catalina Island, Calif. to Gulf of Calif. Type locality, La Paz, Lower Calif.

Grant and Gale state " This species has a very flat shell, which is much smaller than mature shells of scopulosum."

Collecting data: San Felipe, La Paz and Kino Bay (H.N. Lowe Coll.) ; Dr. Joshua L. Baily Jr. reports " We have two distinct species of Sinum in False Bay- S. debile, which resembles S. perspectivum of the east coast, and another with a more inflated shell which I take to be scopulosum."

Sinum pazianum Dall,1919. Catalina Island, Calif. to Panama. Type locality, off La Paz in 26½ fathoms. Figured in Oldroyd.

Sinum keratium Dall,1919. Catalina Island, Calif.

Genus Eunaticina Fischer,1855. Type (by monotypy), Natica papilla Gmelin.

" Shell umbilicated, oval oblong, thin ventricose; spire sharp; inner lip straight, thin anteriorly, with a median callus." Tryon, Manual of Conch.

Eunaticina oldroydii Dall,1897. Oregon to San Diego, Calif. Type locality, off Catalina Island, Calif.

Collecting data: Off Monterey, Calif. in 50 fms. mud bottom (Burch); Monterey Bay 30 to 70 fatgoms (A.G. Smith);

Genus Elachisina Dall,1918. Type (by monotypy), Elachisina grippi Dall.
" Shell minute, elevated, with naticoid spiral sculpture,umbilicate." (Dall).

Elachisina grippi Dall,1918. Off San Diego,Calif. in 16 to 20 fms.

Genus Bulbus Smith,1838. Type (by monotypy),Bulbus smithii Smith. Dr. A. Myra Keen advises on the taxonomy of this genus as follows " As nearly as I can make out without seeing the original reference, Bulbus should be cited as of Smith,1838, with type by monotypy, Bulbus smithii 'Brown' Smith.

" Shell globular, spire very short; columellar margin incurved, columella twisted; lip fragile." Tryon, Manual of Conchology). This is the description of Acrybia H. & A. Adams,1853.

Bulbus apertus (Loven),1847. Icy Cape, Arctic Ocean, south to the Aleutian Islands and eastward to the Shumagin Islands. (Dall).

Dr. A.M. Keen advises on this species as follows: " B. apertus was described by Loven in 1847 and figured by Middendorff in 1851. The type locality is Finmark."

The original description of Natica aperta Loven (Ofversigt af Kongl. Vetens.- Acad. Forh. for 1846,1847, p. 149) is:

" A. congeneribus forma testae recedens,Sigaretum fere referens, N. flavae Gould affinis, testa rimata, tenui, pellucida, ovato-globosa; anfr. 4, untimo maximo, inflato; spira brevis, obtusa; apertura ampla, longitudinalis, ovata, postice, emarginata anfrantu penultimo; lamina columellaris tenuissima, supra umbilicum omnino tectum incrassata, effusa, revoluta , deinde sensim angustata, producta, et in labrum continuata, acutum, tenuissimum, arcuatum; operculum ignotum; 13.5 mm."

Genus Amauropsis Morch,1857. Type (by subsequent designation,Dall, 1909), Natica helicoides Johnson (= ? Nerita islandica Gmelin). fide Grant and Gale.

" Shell with canaliculated sutures. Scarcely distinct from Amaura."

Amauropsis purpurea Dall,1871. Arctic coast westward from Bernard Harbor, to Point Barrow and south to Plover Bay and Nunivak Island, Bering Sea. Type locality: St. Michaels, Norton Sound, Alaska.

Collecting data: Cape Simpson, Alaska (W.J. Eyerdam);

Family Vanikoridae

Dr. Joshua L. Baily Jr. comments on this name " Vanikoro is not a classical name, and is not Latinized. Perhaps that is why Cooke uses the name Narica instead."

Genus Megalomphalus Brusina,1871. Type (fide Fischer,1885), Megalomphalus azonus Brusina.

The systematic position of this group seems to be a matter of some difference of opinion. For example, Theile puts it in the family Fossaridae. But for that matter Theile also puts Iselica Dall,1918, which we have under Fossaridae, in the family Pyramidellidae and at that uses it as a section of another genus. We are trying to answer all such puzzles as these.

Megalomphalus californicus (Dall),1903. Santa Barbara Islands to San Diego (Stanford Coll.).

Type locality, Santa Barbara Islands.

Family Vanikoridae

Genus Vanikora Quoy and Gaimard

This genus is not represented in the California fauna but the following species are listed by Mr. Strong from the south.

Vanikora aperta (Carpenter),1864 Cape San Lucas to Acapulco
Vanikora insculpta (Carpenter),1865 Acapulco
Vanikora ctyptophila (Carpenter),1857 Mazatlan

Genus Choristes Carpenter,1872.

Choristes carpenteri Dall,1908. Acapulco to Panama

Genus Xenophora

Xenophora robusta Verrill,1870 Gulf of California

Genus Megalomphalus Brusina,1871. Type (fife Fischer,1885), Megalomphalus azonus Brusina.

Megalomphalus californicus (Dall),1903. Santa Barbara Islands to San Diego (Stanford Collection).

The following species are fromthe southern fauna.

Megalomphalus occidentalis Bartsch,1907. Magdalena Bay to Gulf of Calif.
Reported from San Felipe, Gulf of Calif.and from Mazatlan by H.N. Lowe.
Megalomphalus souverbiei de Folin Panama
Megalomphalus hancocki Strong and Hertlain,1939 Panama

Family Acmaeidae

The following genera are not reported from California but are from the southern fauna, as listed by Mr. A.M. Strong

Genus Patella

Patella mexicana Brod. and Sby.,1829 Gulf of Calif. to Peru
Patella magellanica Gmelin,1791 Chile to Magellan Strait

Genus Scurris

Scurria aeruginosa Midd. 1849 Gulf of Calif. to Peru
Scurria scurra (Lesson),1830 Peru
Scurria parasitica (d'Orbigny),1841 Peruand Chile
Scurria zebrina (Lesson),1830. Peru to Magellan Straits

Genus Acmaea Eschscholtz,1830

Acmaea limatula Carpenter,1866 Crescent City to Socorro Island
Acmaea digitalis Eschscholtz,1833 Aleutians to San Diego
Acmaea digitalis umbonata Reeve,1855 Alaska to San Diego
Acmaea digitalis textilis Gould,1846 Alaska to San Diego
Acmaea patina Eschscholtz,1833 Bering Sea to Socorro Island
Acmaea pelta Eschscholtz,1833 Bering Sea to Socorro Island
Acmaea pelta monticola Carpenter,1866 Monterey to San Pedro
Acmaea pelta olympica Dall,1914 Alaska to San Diego
Acmaea pelta nacelloides Dall,1871 Alaska to San Diogo
Acmaea scabra Gould,1846 San Francisco to Socorro Island
Acmaea conus Test,1945 Point Conception to Cape San Lucas
Acmaea persona Eschscholtz,1833 Aleutians to Socorro Island
Acmaea atrata Carpenter Lower Calif. to Gulf of Calif.
Acmaea discors Philippi Gulf of Calif. to Clarion Island
Acmaea pediculus Philippi,1846 Gulf of Calif.
Acmaea fascicularis Menke,1851 Magdalena Bay to Gulf of Calif.

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Acmaea mitella Menke,1847	Gulf of California
Acmaea semirubida Dall	Gulf of Calif. to Panama
Acmaea dalliana Pilsbry	Gulf of Calif.
Acmaea asmi Middendorff	Sitka to Socorro Island
Acmae a rosacea Carpenter,1866	Gulf of Georgia to Acapulco
Acmaea depicta Hinds,1842	Santa Barbara to Lower Calif.
Acmaea paleacea Gould,1851	Trinidad to Lower Calif.
Acmaea insessa Hinds,1842	Trinidad to Magdalena Bay
Acmaea triangularis Carpenter,1866	Sitka to Gulf of Calif.
Acmaea funiculata Carpenter,1864	Aleutians to Magdalena Bay
Acmaea variabilis Sowerby,1839	Panama to Chile
Acmaea vernicosa Carpenter,1865	Panama
Acmaea viridula (Lamarck),1822	Peruand Chile
Acmaea orbignyana Dall,1909	Peru and Chile
Acmaea araucana d'Orbigny,1841	Peru and Chile
Acmaea ceciliana d'Orbigny,1841	Chile
Acmaea coffae (Reeve),1855	Chile
Acmaea albescens Philippi,1846	Chile
Acmaea clypeater Lesson	Peru and south
Acmaea stipulata Reeve	Panama and south
Acmaea filosa Carpenter,1865	Panama
Acmaea subrotundata Carpenter,1865	Panama
Acmaea fonsecana Pilsbryand Lowe,1932	San Salvador

Genus Lottia Gray,1834

Lottia gigantea Gray,1834	Crescent City to Cerros Island

Genus Helcioniscus

Helcioniscus nigrisquamatus Reeve	Chile

* Note* Our discussion of the family Acmaeidae will be found in a later issue of the Minutes. *

C.E. Fox, Siota, Solomon Islands. The following letter from the Rev. Fox to Mr. W.J. Eyerdam contains some very interesting items. Excerpts from the letter follow: " Your letter of March 23 reached me June 4". " I received about a dozen letters from American Universities about my shells; but yours is quite different, with the ring of the real enthusiast...... My collection I sent to the U.S.A. Naval Museum. Many officers asked for it, and I wanted to show my gratitude to Americans for all I owe them (e.g. not getting shot). It had some rare and many beautiful shells which I may never get again, but I have begun again with the nucleus of some 600 duplicates remaining over, and am adding. Eventually it will go to Auckland Museum where they have a very good conchologist, A.W. Powell, who is going to identify for me. But if I get a chance I am going to send you some. Of course I know all Mala well and San Cristoval and Rennell (some days on the lake One) but not Choiseul (where there are still Japs). I envy you belonging to a Conchological Club. Any practical hint about collecting would be m most gratefully received. There must be something wrong about my tecnique as I have turned over idly with my foot many rocks without finding gloria maris. Yet that is the tecnique in Miss Rogers book.

As to land shells I'll remember you. I only found 4 Placostylus on N. Mala and never the beautiful green one of San Cristoval which the Mala men didn't know. I had already identified Cypraea isabella but of my 50 or so Cypraea only a few are identified. I am now after the blood red Cypraea

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of Mala, but it is deep and has to be dived for. What is it's name ? The natives are afraid of touching it because of its brilliant blood red color. Thanks for identifying the Voluta. I had 8 or 9 sp. of Pterocera, but have only 6 left and can only identify 2.

I tried raking as you suggest, but no results. Something wrong in my method.

I hope to get about a bit soon. My work is simply that of overseeing language work in the Mission and writing Dictionaries and Grammars. I wrote a dictionary of 30,000 words of Arosi (San Cris.) and am now doing Gela. But I have no fixed duties and can go about as I please. But you cant have left me many Solomon Island shells to collect. ....

What is?:

1. Pterocera with 10 fingers and deep purple lip
2. " with 5 long very slender fingers, purple lip
3. " with thick massive fingers & horizontal striations- quite small
4. " with 14 fingers, medium size
5. Cypraea rather smaller than aurantium, more oblong & sharp pointed. massive, canary yellow
6. Cypraea small white with 3 broad coal black bands across it (brown in worn specimens).

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Jack Schmidt, 406 North K St., Lake Worth, Florida. Jack indicates his interest in purchasing if necessary a specimen or so of the species we list as Forreria catalinensis Oldroyd, as well as any of the west coast species of the genus Trophon. It is an interesting thing to puzzle about when we read the records of some of the collectors of thirty or forty years back, and note that they picked up this species ashore after storms around San Pedro etc. Mrs. Eshnaur had any number of them washed in on Terminal Island. And yet my personal experience with this species has been to bring it up from certainly deeper than 50 fathoms and this is definitely beyond the depth where even the most violent of storms will wash them ashore. Maybe they have just decided to move out into deeper water.

Mrs. Aurora Trethewey, 3796 4th Ave., San Diego 3,Calif. This is the new address of Mrs. Trethewey. She has moved from 1129 Alberta Place.

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S.L. Kimball, Master, Engineer Dredge Secramento, Fleet Post Office, San Francisco, Calif." I have been receiving the Minutes of the C.C. of S. Calif regularly and they have been of gret interest to me and several members of my crew, but as I plan to be leaving here about Feb. 15th I request that from now on you send them to my home in Weaverville, Calif. P.O. Boz 46 where I expect to remain from then on. My collection of shells from here at Okinawa is much bigger and better than from any of the other islands where we have been which includes Guam,Eniwetok,Johnston,Midway,Palmyra,Christmas and Oahu. You are doing a great job and I am sure there will be many new collectors added to your list in the near future. Hope to be seeing you early next summer."

Mr. A. Byron Leonard, University of Kandas, Department of Zoology, Lawrence, Kansas. We are pleased to add the above name to our subscription list. Mr. Leonard has done some excellent work in conchologyand we have several of his papers in our library at this time. We hope and expect to see more.

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
February 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please maill all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax.2-7965

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Family Lamellariidae

Genus Lamellaria Montagu,1815. Type (fide Winckworth,1932) Lamellaria tentaculata Montagu (= Bulla latens Muller,1776).

" Shell internal, ear-shaped, thin pellucid; spire lateral, very small; aperture large, patulous, both lips regularly arcuated; axis imperforate. No operculum." (Tryon, Manual of Conchology).

Lamellaria sharonae Willett,1939. Nautilus 52:123,124, pl. 9, figs. 1,1a,1b.

Mr. Willett told a number of us while he was working on this species that he was not entirely satisfied that it should go under Lamellaria, but this seemed to be the only allocation available without describing a new genus for the species. It is certainly quite different from any of the other West Coast species of this genus.

Collecting data: We collected perhaps 100 specimens all in the same habitat. They were on yellow sponge growing on the bridge pilings in Anaheim Bay and in almost the same habitat in Newport Bay. A number of us carried this in our collections for several years before its description under a number of different names so all sets bearing unusual specific names of related genera should be checked for this species.

The range is confined to Anaheim and Newport Bays so far but surely it will be found elsewhere in similar places.

The original description was L. sharoni sp. nov. However, Dr. A. Myra Keen advises that the name should be emended to sharonae since it was named in honor of Mrs. Ruby Sharon.

The original description follows:

" Shell fragile, entirely internal, naticoid, inoperculate, imperforate; white, covered with a very thin, light pinkish epidermis. Aperture rounded below, the outer lip and columella merging to form three-fourths of an almost perfect circle. Outer lip thin meeting the body at an acute angle. Columella light brown, thin, regularly curved, with a shallow groove between it and the body whorl. Surface of shell marked by irregular growth lines and very fine spiral striations. Shell higher than wide, about the shape of some specimens of Polinices altus Dall, though very much smaller. Measurements of shell: Max. diam., 5.5; min. diam. 4.9; alt. 7.4 mm.: alt. 6; diam. 4.3 mm.

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Mantle of animal completely covering shell, roughly papillose, vinaceous rufous above, somewhat lighter below. In the center of the mantle, above, is a rather poorly defined hexagonal, flattish area, the diameter of which is about one-fourth the length of the animal. From each of the six angles of the central area a poorly defined ridge runs to the lower part of the mantle, each ridge being ornamented with from one to three dusky spots; also in the middle of the central area, and in each of the six areas between the ridges is a single black spot (Fig. 1b)."

" The naticoid form of this shell at once distinguishes it from Lamellaria stearnsi, diegensis, rhombica, or digueti, as well as from any other species of the group known to the writer. Of the subgenera usually placed under Lamellaria , it is probably closest to Marsenina or Coriosella in shell characters. The mantle, however, is not fissured."

Lamellaria stearnsii Dall,1871. Alaska to Tres Marias Islands (Strong & Hanna). Type locality, Monterey, Calif. Figured in Oldroyd.

Collecting data: In our experience this is by far the most common species of the genus and it is not common. We have taken it by pulling up holdfasts from a rowboat off Malaga Cove, L.A. Co.; a number of them collected on sponge under stones at Cayucos by Mrs. John Q. Burch. (Burch); Pacific Grove, Calif. (A.G. Smith); Crescent City (Chace); Monterey (Button); San Pedro (Lowe); Mission Bay (Mr. and Mrs. Ralph Bormann).

Lamellaria stearnsii orbiculata Dall,1871. Sannakh Islands, Alaska to Gulf of Calif. Type locality, Monterey, Calif. Also figured in Oldroyd.

Collecting data: We have labelled specimens with this name, but I see nothing important about collecting a dozen specimens in one spot and selecting the larger and more mature specimens for orbiculata and calling the rest of them just stearnsii. It is probable that I do not know the real distinctions if there are any. (Burch); " Agree that this subspecies has doubtful taxonomic value" (A.G. Smith);

/ to Pts. Penasco, Gulf of Calif.

Lamellaria diegoensis Dall,1885. San Pedro and the Islands to San Diego, Calif. Type locality, False Bay, near San Diego, Calif. (Mission Bay).

Collecting data: We have taken typical specimens from the type locality in Mission Bay (Burch); Mission Bay (Lowe); San Pedro (Lowe); Pta. Penasco (Lowe) (San Diego Museum).

Lamellaria digueti Rochebrune,1895. We are dropping this name from our faunal list. The matter was discussed under our work on Pleurobranchus. The error is obvious since Dr. Dall gives exactly the same reference even to page for both Pleurobranchus digueti and Lamellaria digueti. The consensus of opinion is that digueti is a species of Pleurobranchus.

Subgenus Marsenina Gray,1850. Type (by monotypy), Lamellaria prodita Loven.

Lamellaria rhombica Dall,1871. Neah Bay, Washington to Magdalena Bay, L.C. Type locality, Monterey Bay, Calif. Figured in Oldroyd.

Collecting data: Monterey (Oldroyd); Pacific Grove 0-15 fms. (A.G. Smith)

Genus Onchidiopsis Bergh,1853. Type (by monotypy): O. groenlandica Bergh. And in addition on this genus Dr. A.Myra Keen advises " I note that Dall proposes a subgenus Atlantolimax for O. hannai (Proc. Acad. Nat. Sci. Philadelphia for 1916, p. 376), type by original designation. " Adult with a large dorsal foramen in the notaeum." Whereas he describes Onchidiopsis s.s.

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as " Adult animal with an impervious notaeum."

Subgenus *Atlantolimax* Dall,1916. Type (by original designation), O. *hannai* Dall.

Onchidiopsis hannai Dall,1916. St. Paul Island, Bering Sea.

Onchidiopsis sp. Reported by Mr. W.J. Eyerdam from Drier Bay, Knight Island, Pr. Wm. Sound, Alaska,1923; and Raspberry Island, Alaska, on stones, 1945.

Family Velutinidae

Genus *Velutina* Fleming,1821. Type (by original designation and absolute tautonomy) *Bulla velutina* Muller. (*Velutina vulgaris* Fleming) = *Helix laevigata* Linneus.

" Shell thin, with a velvety epidermis; spire small; suture deep; aperture very large, rounded; peristome continuous, thin. No operculum." (Woodward).

Velutina rubra Willett,1919. Nautilus 33:25, July,1919. Forrester Island, Alaska.

The original description follows. This species was overlooked by both Dr. Dall in Bull. 112 and Mrs. Oldroyd.

" In life similar to *V. cryptospira* but animal bright vermillion in color (this color soon dissapears in alcohol). Shell smaller than that of *cryptospira*, rounder and with only a trace of spire. The type measures 13½ mm. in length by 9 mm. in breadth. This type together with four additional specimens were taken on Forrester Island by the writer. Three of these specimens were found at extreme low tide mark and the other two were dredged in 40 fathoms."

Velutina prolongata Carpenter,1865. Bering Strait to Monterey, Calif. Type locality, Neah Bay.

Collecting data: Forrester Island, Alaska (G. Willett); Mr. A.G. Smith advises on the Monterey record as follows " Dall's Monterey specimen in the U.S.N.M. looks like an abnormal *V. laevigata* according to Gordon. The Monterey record needs confirming. 1 specimen cf. *prolongata* from Little River, Mendocino Co."; San Juan Ids, Wash.(Eyerdam).

Velutina zonata Gould,1841. Icy Cape, Arctic Ocean to **Monterey** Calif. **Also Atlantic. Type** locality, Chelsea Beach, Massachusetts.

Collecting data: Puget Sound (Lowe); Mr. A.G. Smith comments " Dall's record is the only one reported south of the Pribilof Islands. I consider it doubtful for this northern species.";

Velutina laevigata (Linnaeus). Icy Cape, Arctic Ocean to Vayucos,Calif. San Luis Obispo Co. (Burch). Type locality not given.

Collecting data: Dredged off Monterey in 15 fms. shale bottom; San Simeon,Calif. at minus tide under rocks; Cayucos, Calif. in rocky rubble (Burch) Crescent City(Chace); Orcas Id. (Dr. F. Baker); Forrester Id. (Willett); Puget Sound(Button); Sweden(Anderson) (San Diego Museum); Izhut Bay, Afognak Island, Alaska,1922; Drier Bay, Knight Island, Alaska,1923;(Eyerdam); Monterey Bay 0-12 fathoms (A.G. Smith).

Velutina conica Dall,1886. Aleutian Islands eastward to Kodiak and south to Forrester Island, Alaska/ Type locality, Unalaska.

Velutina granulata Dall,1919. Monterey, Calif. in 55 fathoms.
Mr. A.G. Smith sent in the collecting record " 28-35 fms. off Pt. Pinos (U.S.F.C.). Known only from the type specimen."

Velutina coriacea (Pallas),1788. Bering Sea and the Okhotsk Sea.
Dr. A.M. Keen advises on this species " The type locality of Velutina coriacea (Pallas) is Kurile Islands. The reference given by Oldroyd is not quite accurate. It should be: Nova Acta Acad. Sci. Imp. Petropolitanae for 1784 (1788), vol.2, p. 243, pl.7, figs. 31-33."

Velutina cryptospira Middendorff,1849. Gulf of Alaska to Forrester Island, Alaska. Type locality, Shantar Island and northern Okhotsk Sea.
In Nautilus 33:25 Mr. George Willett comments on this species and his species rubra as follows: " I am very much averse to referring this and the next species to the genus Velutina, as in life they are so entirely dissimilar to laevigata, the type of that genus. In laevigata the shell is mossy and is, so far as I have seen, entirely bare, while in these two species the shell is smooth and completely covered by the animal. On the other hand, both the animal and shell differ markedly from the genus Lamellaria."
Collecting data: Forrester Island, Alaska (Willett); Gulf of Kronotski, Kamchatka,1925 (W.J. Eyerdam).

Velutina sitkensis A. Adams,1851. Bering Sea; Sitka,Alaska (Adams). Type locality, Sitka, Alaska.

Genus Torellia Jeffreys,1867, ex Loven MS. Type (by monotypy), T. vestita Jeffreys.

Torellia ammonia Dall,1919. Southwest of Sannakh Island, Alaska in 41 fms.

Torellia vallonia Dall,1919. Nazan Bay, Atka Island, Aleutians.

Family Lepetidae

Genus Lepeta Gray,1847. Type (by monotypy and original designation), Patella caeca Muller.
" Shell patelliform, the embryonic nucleus spiral, lost in the adult, apex in front of the middle; no internal septum."

Subgenus Cryptobranchia Middendorff,1851. Type (by subsequent designation, Dall,1870), Patella caeca var. concentrica Middendorff.
Dr. A.M. Keen advises that Dall's later substitute, Cryptoctenidia,1918, was unnecessary.
Dr. Joshua L. Baily Jr. comments on this matter (Per. Comm. Nov. 1945) " Cryptobranchia was discarded by Dall because Cuvier had used this name long before Middendorff. But Cuvier did not apply it to a genus, but to an order of equal rank with Pectinibranchia, therefore Middendorff's name is not preoccupied, and Dall was wrong in substituting Cryptoctenidia for it. His name falls into the synonymy of Middendorff's name."
" Apex inclined forward, the anterior terminations of the muscle-scar not in front of it. Surface not granulate; color whitish. Apex of rhacidian tooth tricuspidate, the cusps nearly equal; uncini spatulate." (Pilsbry).

Lepeta concentrica Middendorff,1851. Icy Cape, Arctic Ocean, on the west to the Okhotsk Sea and Shantar Islands, on the east to Forrester Island, Alaska (Dall). to Puget Sound (Oldroyd).
Type locality: Ohkotsk Sea.
Collecting data: Mr. George Willett in Minutes #18 stated " ... is rather

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common in moderate depths in Alaskan waters. The sculpture and proportions are quite variable in this species, and I doubt whether Lepeta alba is distinct from it. Its lighter color, inside and out, readily distinguishes it from most Acmaeas."

Mr. W.J. Eyerdam reports the species from Izhut Bay, Afognak Island; Drier Bay, Knight Island,1923; Sitkalidak Island,1931; Raspberry Island,1945 . Glacier Bay, Alaska (Kate Stephens); Bear Bay, Peril Straits and Windfall Harbor (Kate Stephens); Orcas Island, Puget Sound (Dr. F. Baker); Seward, Alaska (Dr. F. Baker); Drier Bay, Knight Island (Brown) (San Diego Museum).

* Note* In Minutes # 18: 3,4 Mr. George Willett discussed this genus in his paper " Some Limpet-like mollusks of western North America."

Lepeta caecoides Carpenter,1865. Arctic and Bering Seas to Hakodate,Japan, the Aleutian Islands and south to the Farallones Islands,Calif. (Dall). Type locality, Puget Sound and the Farallones.

Collecting data: Ixhut Bay, Afignak Island, Alaska 1922; Drier Bay, knight Island,1923; Evans Island,1924; Sitkalidak Island,1931; Thum Bay, Knight Island,1940; Raspberry Island,1945 (W.J. Eyerdam).

Lepeta alba Dall,1869. Bering Strait and Sea south to Fuca Strait. Type locality: Seniavine Strait and Plover Bay, East Siberia.

Collecting data: Sitkalidak Island, Alaska,1931; Raspberry Island, Alaska,1945 (W.J. Eyerdam).

Lepeta alba instabilis Dall,1869. Unalaska to the Shumagins and south to Sitka Sound, Alaska. Type locality, Sitka, Alaska in 10 fms.

Family Acmaeidae

No family group in our fauna has been the source of more differences of opinion than this one. Not only the identification of species but the taxonomy of the entire group has been in a state of confusion. When and if the problems are all settled the lists of synonymy will be long.

Mrs. Avery Grant Test was awarded her Ph. D. degree from the University of California in 1937 for her work on the genus Acmaea. Many of her conclusions have been passed among us more or less by word of mouth and have been rather generally accepted. Wesincerely hope that Mrs. Test's entire thesis will be published and made available for general use. Therefore, we feel some reluctance even in this informal discussion to quote Mrs. Test when such quotations are without having asked her permission and are at least in legal parlance " hearsay" and inadmissible.

Dr. A. Myra Keen advises on this matter: " Some years ago, when I was preparing the Abridged Check List, Mrs. Avery (Grant) Test gave me a list of corrected ranges and names for Acmaea which I found of great use, as she had given the group thorough study for her thesis (unfortunately not yet published). She indicated that she had arrived at the following classification, on the basis of study of radulae as well as shells:

Acmaea (Acmaea)
mitra,depicta,funiculata, sybaritica,
Acmaea (Collisella) Type, o.d, Dall,1881, Acmaea pelta)
asmi,digitalis,instabilis,limatula,ochracea,scabra,triangularis,cona
Acmaea (Patelloida)
fenestrata fenestrata, fenestrata cribraria, insessa,paleacea, persona, testudinalis (? - tessulata)/ scutum, testudinalis testudinalis,
Acmaea (Rhodopetala)
rosea

(con.)

Acmaea ??
rosacea

Genus Acmaea Eschscholtz in Kotzebue1830. Type (by subsequent designation, Dall,1871), Acmaea mitra Eschscholtz.

" Shell conical, patelliform, apex more or less anterior. The shells may generally be distinguished from Patella by the different texture and margin border inside." (Tryon & Pilsbry, Manual of Conchology).

Dr. Joshua L. Baily Jr. comments on the type designation (Per. Comm.) " Dall did not designate Acmaea mitra as type of Acmaea, but merely stated that Philippi's designation was published, and I do not know where Philippi's designation was published and apparently no one else does, for I have never seen this species credited to any other author than Dall, except in Dall's own paper. If this designation by Dall is illegal- and I believe it is, the next designation must be used. I do not know what other designations have been made, but I believe there have been others, as Acmaea mitra was at one time believed to be a Scurria. If any student should decide that distinction between Acmaea s.s. and Colisella is of generic value the old familiar name Acmaea will have to be discarded, which would be very unfortunate."

Subgenus Acmaea s.s. Type: A. mitra Eschscholtz

Acmaea mitra Eschscholtz,1833. Pribilof Islands, Bering Sea south to San Martin Island,(Baker). Type locality, Sitka, Alaska.

Collecting data: Our experience with this species has been very interesting. Of course, we collected them in numbers from Puget Sound south to Cayucos, Calif. littoral with the numbers becoming fewer as we progressed southward. The species even in the north seems to be a little lower in the water than the rest of the littoral species. We were therefore quite amazed to bring up A. mitra in dredging off Redondo Beach from such a surprising depth as 75 fathoms. Another surprise came to us while collecting in and around Todos Santos Bay, L.C. We had been working the rubble reef at Punta Banda and collecting the warm water species, many of them either not recorded at all north of there or extremely rare- such things as Acanthina lugubris and Pallochiton languinosus. We decided to climb over the range of hills to the open sea on the outside of the bay at Arbolitos. When we stepped out on the rocky rubble at Arbolitos we could scarcely believe out eyes. The rocks were covered with Acmaea mitra and other northern forms. Placiforella velata was common on the rocks. Even the crustaceans reminded us that we were back to Monterey or farther north. The secret of the situation seemed to be that the shore dropped off abruptly to some depth resulting in an upsurge of cold water. Obviously temperature is more important to molluscan fauna than latitude. We took it from the backs of Haliotis rufescens at Morro Bay, and dredged it off Monterey most common around 20 fathoms. Not uncommon in the Pleistocene of Timm's Point, San Pedro. (Burch); " I have collected this species at many localities in Alaska and Puget Sound, always near low tide mark. It is often infested with peculiar knobby nullipores. Some of the largest are 1½ inches in diameter. I have a whole drawerfull showing many variations." (W.J. Eyerdam); Port Graham, Alaska (Baker) to So. Coronado Island (Baker) (San Diego Museum).

Acmaea funiculata (Carpenter),1864. Shumagin Islands, Alaska to Magdalena Bay, L.C. Type locality, Monterey, Calif.

Dr. G.D. Hanna and Allyn G. Smith were authors of a fine paper on this species in Nautilus 45:21-25, pl.2, July,1931.

[illegible]

(cont.)

[illegible]

(cont.)

(cont.)

In this paper the authors establish the facts that funiculata differs from mitra anatomivally and that it does belong in Acmaea which was at one time questioned. However, there is some difference of opinion about the above conclusions and this species is frequently placed in the synonymy of A. mitra.

Collecting data: Mr. George Willett dredged this species off Forrester Island, Alaska and also in the channel between Catalina Island and the mainland. We failed to dredge it locally but have fine specimens dredged off Monterey in 20 fathoms on the shale. (Burch); Catalina Island in 35 fms. (Lowe); Izhut Bay, Afognak Island, Alaska,1922; Raspberry Island,1945; Sitkalidak Island,1931 (W.J. Eyerdam).

Acmaea depicta (Hinds),1842. Santa Barbara, Calif. to Lower California on " Zostera". to lat. 27 (Keen). Type locality, San Diego, Calif.

Collecting data: Our experience has been to find this species comparatively rare in number of localities but exceedingly abundant where found. It is found on the broad leaved eel grass of the estuaries and in our experience never on the open coast. We have taken it in great numbers from the eel grass of Mission Bay, San Diego Co. and also from the Estero below Ensenada,Mexico. We found it in the dredgings of Newport Bay indicating that it has been there comparatively recently. However, we finally decided to label the Newport Bay specimens subfossil since no living member of the club could recall having taken a living specimen. It is not uncommon in the Pleistocene of Hilltop Quarry. (Burch); LaPlaya (Bristol); La Jolla (Orcutt); S. of Ensenada (Lowe);

Acmaea sybaritica Dall,1871. Plover Bay, Eastern Siberia, to Hakodate,Japan on the west; on the east from the Pribilof and Aleutian Islands to Chirikoff Island. (Dall). Type locality, St. George's Island, Pribilof Group, Bering Sea.

Acmaea aleutica Dall,1927. Nautilus 40:101. New name for A. apicina Dall, 1879. Pribilof, Aleutian and Shumagin Islands, Alaska.
Type locality: Chika Island, Akutan Pass.

Subgenus Patelloida Quoy & Gaimard,1834, Voy. " Astrolabe", Zool. III, p. 349. Type (fide Winckworth), P. rugosa Quoy & Gaimard.

Acmaea tessulata (Muller),1776. (A. testudinalis (Muller))
Range: Southern Bering Sea northwardand eastward to the Atlantic.

The following data from Dr. A. Myra Keen (Per. Comm.) " Mrs. Test considered scutum to be a variety of the Atlantic testudinalis; she found that the typical varietu of the latter occurs on our coast, also. I note that Winckworth (Jour. Conch. vol. 19, 1932, p. 219) places testudinalis Muller in the synonymy of tessulata Muller,1776. According to Sherborn both names were used by Muller, Z. Dan. Prod., 1776, p. 237. I have not seen the original reference. Evidently the type locality (fide Dillwyn) is Norway. Mrs. Test gives the range on the American West Coast as Southern Bering Sea northward and eastward to the Atlantic. There are specimens in the Stanford Collection from Kodiak Island."

In the synonymy of this species we should no doubt place Acmaea emydia Dall,1914. Arctic Ocean and northern Bering Sea to Nushagak,Alaska and the Pribilof Islands,and Attu Island.(Dall). The original reference is Nautilus 28:14, June,1914 in which Dr. Dall under " recognizable mutations of A. patina

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" lists as follows"..; emydia Dall (the Arctic testudinalis of my 1871 paper) Figured and described in Am. Jour. Conch. v.6, p.249, pl.14, fig.3. Dr. A. Myra Keen advises " Re emydia Dall. Apparently Mrs. Test inclines to Dall's 1871 view that the Arctic form is testudinalis Muller. Hence, she would synonymize emydia. The radula only was figured by Dall, Am. Jour. Conch. vol.6, p. 249, pl.14, fig.3,1871."

Acmaea testulata scutum Eschscholtz,1833. Southern Bering Sea to Tugur Bay and the Shantar Islands on the west, and from the Pribilof and Aleutian Islands on the east south to the Gulf of California and Socorro Island.(Dall), Type locality, Sitka, Alaska.

Dr. Joshua L. Baily Jr. comments on the name scutum " Dall used Acmaea scutum instead of Acmaea patina , and Acmaea cassis instead of Acmaea pelta because the names he used had page priority. I reversed this usage and followed Carpenter, the first reviser of Eschscholtz's work, on the advice of Dr. Pilsbry."

There are among other described forms of scutum the following color varieties: A. patina Esch.ch.,1833; A. pintadina Gould,1846. The consensus of opinion is that they are of no consequence and should be in the synonymy.

Collecting data: " I have a great many lots of this species and its intergrades from Washington to Kamchatka, but have given up trying to name them exactly" (W.J. Eyerdam). Most of the rest of us will ditto these remarks.

Another form to be placed in the synonymy is A. scutum parallela Dall, 1914. Sitka, Alaska to Victoria, British Columbia on eel grass. The original description of this species amounted to a mere listing by Dr. Dall in Nautilus 28:14. In this paper he listed under " recognizable mutations of patina..." " and parallela Dall; the latter corresponding to the A. alveus of the Atlantic coast." I have a large set of this form collected by Mr. George Willett in 1936 at Ketchikan, Alaska. It seems to be obviously a situs form growing on eel grass. " (Burch.). Mr. Eyerdam reports taking it at Victoria, B.C.

Acmaea fenestrata fenestrata (Reeve,1855). Cayucos, Calif. south to Lower California.

Dr. A. Myra Keen writes on this problem as follows (Per. Comm.) " The International Rules provide that when an author bestows several names simultaneously on what later is seen to be a single species, the desision of the first reviser as to the proper synonymy will stand. Mrs. Test found that the first person to recognize the identity of cassis and pelta chose the latter name; the first person to recognize the identity of patina and scutum chose scutum. For the cribraria-fenestrata tangle: she found that there is geographic as well as morphologic separation. From Sitka to Cayucos (lat 57 to 35) one find cribraria; southward of Cayucos one finds fenestrata. She said, as I remember it, that the principal difference is in the bluish tint of the interior."

The original description of A. fenestrata follows:

Patella fenestrata Reeve, March,1855. Conch. Icon. pl.38, sp. 120. Type locality, Upper California. Original English description: " Shell ovate, a little attenuated in front, rather thin, depressly conoid, apex prominent, rather obtuse, radiately densely finely striated, striae a little waved; greenish, finely tessellately mottled with ash-olive, interior bluish-ash, with a broad black border." (con.)

Mr. A.G. Smith commented on this species after having observed "Shells having a fine tesselated or " fenestrated" color pattern, with dark apex, which is whitish at the extreme tip".

Collecting data: Our experience with this species has been to find it rather scarce. We took large sets of them from the beaches north of Santa Monica and also at Dana Point. The habitat of the Santa Monica specimens was on large stones on and surrounded by sandy beach. (Burch).

Acmaea fenestrata cribraria Carpenter,1866. Alaska, Aleutian Islands south to Cayucos, Calif. Type locality " purchased in the Sandwich Isles."

Collecting data: We now have this matter neatly disposed of. If you get it from the townsite in Cayucos it is cribaria , but if it comes from across the channel on Morro Rock it is then typical fenestrata. (Burch). Mr. W.J. Eyerdam reports the species from: mouth of Speel River, S.E. Alaska, 1928; Unimak Island, Aleutians,1932; Raspberry Strait, Alaska,1945; Port Ludlow, Jefferson Co., Wash.

Acmaea insessa (Hinds),1842. Alaska south to Magdalena Bay, L.C. Type locality, San Diego, Calif. on seaweed.

Collecting data: Abundant from Monterey south to Todos Santos Bay in my experience and particularly abundant on the genus Egregia. However, we have taken it from other species of algae. The habitat is on the stalks or holdfasts of the algae.(Burch); Challam Bay, Strait of Fuca,Wash. (Eyerdam); San Simeon (Wilcox); Monterey (Orcutt); San Diego (J.M. Cooke); La Jolla (Beckwith and Bristol); Santa Barbara (Carl Hubbs); kelp barge from Carponteria to Summerland. (San Diego Museum)

Acmaea paleacea Gould,1853. Vancouver Island to Guadalupe Island (Strong). Type locality, Santa Barbara, Calif.

Collecting data: As distinguished from A. d epicta of the estuaries, this species is found on the narrow eel grass (Phyllospadix torreyi Wats) of the open coast. It is particularly abundant in such localities as Dana Point, Orange Co. and San Ohofre. We have it from Crescent City, Calif. to Todos Santos Bay. (Burch); No. Coronado Id. (F. Stephens); Crescent City (Chace); S. Coronado Island in 6 to 8 fms.(F. Baker); Laguna Beach (Lowe); La Jolla (Bristol and Orcutt); San Diego (J.M. Cooke).

Acmaea persona Eschscholtz,1833. Shumagin Islands, Alaska to Monterey,Calif. Type locality, Sitka, Alaska.

Dr. A. Myra Keen comments on this speciesa nd the subspecies following (Per. Comm. Nov.1945) " The paragraph from Tryon a nd Pilsbry in Oldroyd (vol. 2, pt.3, p.155) refers to digitalis, not persona, due to Carpenter's mididentification of persona."

" The taxonomic history of the name strigillata is complicated. In June 1864, Carpenter (Ann. Mag. Nat. Hist., ser. 3, vol. 13, p. 474) described Acmaea strigatella withthe type locality Cape San Lucas (description in Latin copied in Oldroyd, p.155, as strigillata). Carpenter comments, " This might be regarded as a cross between the northern forms A. pelta and A. patina about to change into the Gulf species, A. mesoleuca." In August,1864 ((Suppl. Rept. Brit. Assoc. p. 618) he referred to this description in the Annals and cited the page but erroneously spelled the name as " Acmaea strigillata." He mentions that the species also occurs at Margarita Bay. In 1866 (Am. Jour. Conch., vol. 2, p. 334) Carpenter described a new variety

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of Acmaea patina, var. strigillata, from a MS name of Nuttall's. No type locality was given other than Northwest Coast. After comparing it with the typical and with A. pelta he says " but young shells, with the outside abraded, are very difficult to determine or to separate from A. strigatella of Cape San Lucas; q.v. in Ann. Nat. Hist." Dall in Bull. 112 listing cites Carpenter's second 1864 usage and his 1866 usage, neither of which would seem to be valid. One is a typographical error, the other a homonym. If we recognize this form as varietally distinct, we must use the name strigatella However, I leave it to you collectors to decide on the biological validity of the form."

Collecting data: The large distinctive specimens of this species from the north need no comments. We have collected it around Puget Sound, Crescent City, Calif. etc. The only problem arises when you run into large specimens from middle California and wonder whether it should be labelled typical or the variety strigatella. There seems to be no question but that the two are separable if typical specimens from the north are compared with southern specimens. It seems to me that persona grades into strigatella with the latter the common form in southern California. (Burch).: " I have collected this species and varieties at many localities in Puget Siund and Alaska" (Eyerdam); Mole Harbor, Admiralty Islands, Alaska (Kate Stephens).

Acmaea persona strigatella Carpenter,1864. Monterey to Lower Calif.

Collecting data: Our common small southern California shell with the dark grey interior is my idea of strigatella. The theory being that persona is the northern form and strigatella the southern form of the same species. (Burch).

Subgenus Collisella Dall,1871. Type (by original designation), Acmaea Pelta Eschscholtz.

Acmaea pelta Eschscholtz,1833. Okhotsk and southern Bering Sea, Nushagak, Alaska, the Aleutian Islands south to Rosario Bay, Lower Calif. and Socorro Island (Dall). Type locality, Sitka, Alaska.

The following are thought by many including myself to be mere variations of a very variable species conforming to habitat: A. cassis(Esch.), 1833; A. nacelloides Dall,1871; A, monticola Carpenter,1866; A. olympica Dall 1914. There may be those of the opinion that the above or some of them are valid subspecies. I feel quite certain that the form we know as cassis being the rough stout ribbed one and nacelloides being either the kelp form or from stones after having started its life on the kelp, should be in the synonymy. It is possible that olympica , a small conical form which seems to be confined to a habitat commensal on Ostrea or Mytilus largely around Puget Sound may be a good subspecies. There are a number of other names such as hybridi Hemphill which seems to have been based upon a form suchas nacelloides but ubusually high. I have a set of pelta collected at Nemuro, Japan. They seem to be typical. (Burch). W.J. Eyerdam reports on this species as follows : " This species and many varieties are common on the rocks of Puget Siund and along the whole coast northward to Alaska and the Aleutian Islands. I have about 1000 specimens showing much variation. Lots collected by Eyerdam in Kamchatka and Japan seem to be typical. Acmaea olympica Dall,1914. I have several hundred paratypes from Olympia, Wash. on native oysters; also in several localities in Alaska from mussels.None

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of them are over ½ inch in length. It also has distinctive markings, and should be considered either a species or a subspecies of A, pelta which is much larger and has a different habitat. The many lots of Acmaea nacelloides in my collection are quite distinct from A. pelta and certainly rate at least a subspecific name. Acmaea (cassis)Vpelta monticola Carpenter . I have this subspecies from Del Rey, California collected by Stanley Field. It is commensal on mussels and is perhaps the counterpart of the northern A. pelta olympica but is higher in elevation and with a different color pattern. Seems to be a good species.

Miss Bristol of the San Diego Museum of Natural History reports many localities in Alaska and on down to San Diego. Also from Nemuro and Abaskiri , Hokkaido, Japan by Dr. F. Baker.

The consensus of opinion among the members is that this is but one very variable species with the following in synonymy : cassis Esch.1833; fimbriata Gld.,1846; pileolus Midd. 1847; cinis Rve.,1855; nuttalliana Rve. 1855; leucophaea Rve.,1855; textilis Adams,1858; fimbriata Gld.,1863; pintadina Gld.,1862; tesselata Binney,1863; var nacelloides Dall,1871; var hybrida Shepard,1895;73; olympica Dall,1914; monticola Dall,1914.

There are sets labelled hybrida in some southern California collections. It might be of interest to reprint the original description of this variety.- Shepard, I.M., 1895- Nautilus 9 :72-73 " In one natural color phase, the entire external surface is beautifully glossy black (the variant nacelloides,...), while others, with normal color patterns are black and white, in various designs and oroportions of the two colors. Still others show the pure black coloration on the lower half of the shell, but have a black and white pattern on the upper half of the shell, Such specimens are often compressed and spread in the lower half of the shell, in which case they have been called hybrida Shepard,1895."

Acmaea asmi Middendorff,1849. Sitka, Alaska to Soccoro Island,Mexico.
Type locality, Sitka , Alaska.

Collecting data: The only confusion that I have noticed with this species is that I recently observed some shells identified as this species that are in reality the small black form of A,pelta which is in places very common on sea weed as well as adjoining stones, However, bhe two are easily separable and about all they have in common is size and both being black. We have taken asmi always on Tegula from Crescent City to Todos Santos Bay. In the northern part of the range the habitat seems to be on Tegula funebralis , but around Todos Santos Bay they are found on Tegula gallina. (Burch); Crescent City (Chace); Cambria (Wilcox); S. of San Quintin Bay (Orcutt); San Diego (Hemphill); Todos Santos Bay (Orcutt); San Nichlas Island (Lowe);

Acmaea instabilis (Gould),1846. Kodiak Island, Alaska south to San Diego Calif. Type locality, Puget Sound.

Collecting data: The southern record of this species may be in doubt. I note that Dr. Keen stops the southern range at Monterey. However, I have collected it at Cayucos, San Luis Obispo Co. and see no reason why it might not be taken fatther siuth, rarely. It is particulatly abundant at Crescent City, Calif. (Burch); Farallones Islands (Arnheim); Neah Bay, Wash. (Oldroyd); Crescent City (Chace); San Simeon (Wilcox); Duxbury Reef (Lowe); Pt. Reyes (W.P. Cook) (San Diego Museum); Challam Bay, Clallam Co., Wash. 1925 on kelp holdfasts (Eyerdam).

Acmaea ochracea Dall,1871. (peramabilis Dall 1879) Alaska to San Miguel Island. (Test). Type locality, Vancouver district.

" Apex in second quarter of shell, erect, forming an obtuse cone. All faces nearly plane. Aperture oviform. Sculpturing of straight, unbranched sharp cut striae (threads) proceeding from apex to border with very little increase in magnitude. Interspaces exceedingly small near apex wider as margin is approached: very flat. Margin entire, sharp. Internal finish highly lustrous, of very thin nacre, with external coloring and sculpturing showing through. Interior characterized by broad pinkish tawny border, pink tinged intermediate area, and chestnut apical area of good size but no special shape. Color of interior yellowish-buff, tinged here and there with rose. The species is sometimes infected with fungus (Bonar,1936), sometimes coated with a heavy coat of red brown algae, sometimes flecked with spots of coralline algae, but most often in large part free of infecting extraneous growths." Variations: " The pale variant has likewise been considered to intergrade with scutum. This error was caused by the failure on the part of some workers to distinguish light-color phase specimens of limatula which had fine sculpturing from scutum, and who considered such specimens to be intergrades between scutum and ochracea. A study of the radular ribbon alone suffices to disprove this idea, since it shows that scutum and ochracea do not belong to the same subgenus." " ... does not actually extend up into the intertidal belt at all. Individuals are almost never found exposed by the tide, not even located in isolated tidepools, but only where the tide leaves a considerable amount of water which is continually replenished by wave action throughout the intertidal period." The chosen roosting site of individuals of this genus is very characteristic, being upon solitary, rather small rocks which are usually devoid of other kinds of inhabitants." (Test)

The above are extracts from some of Mrs. Test's work and noted by one of the members. It is of great interest because the validity of this species has been in some question. The general idea seems to have been that they were juvenile scutum. Mr. and Mrs. E.P. Chace collected specimens of this species from the deeper tidepools at Pt. Pinos and noted that about ½ of them were light colored. It is difficult to analyze this situation. It is obvious that shells from the deeper tidepools will be of smaller size, less eroded, show their ribs better than perhaps the same species higher up. Apparently no member of the club has reported taking this species south of the Monterey region. While the range is listed as given by Mrs. Test south to San Martin Island, it seems certain that the same shells collected by the Chaces at Pt. Pinos are exceedingly rare in southern California if found her at all.

Another interesting thing about this problem is the placing of peramabilis Dall in the synonymy. That species has been considered distinct. Mrs. Test we are told considers it a synony, but for the sake of the record here the data on that species follows.

Acmaea peramabilis Dall,1872. Shumagin Islands, Alaska on granite rocks only. south to Prince William Sound (Eyerdam). Type locality, Shumagin Islands.

Collecting data: Drier Bay, Knight Island, Alaska,1923. " A small rare species - dredged on stones. The five specimens that I collected were identified by Dall. They resemble Lepeta caecoides but are pink. There is no close relationship to scutum in these specimens." (Eyerdam).

Acmaea triangularis Carpenter,1864. Sitka,Alaska to the Gulf of Calif. (Dall). Type locality, Monterey, Calif. We are advised that the Gulf record is seriously questioned. Dr. A. Myra Keen advises " The latitude range for A. triangularis should be 37-39, not 33-39 as I gave it in my Abridged Check List."

Collecting data: Our only experience with this species which seems to be very distinct indeed was in the Monterey Bay dredgings both off Del Monte and off Pacific Grove. Laving specimens collected in some numbers from coralline algae littoral. Mr. E.P. Chace was responsible for first collecting this littoral and showing us where they were in our group.

Acmaea digitalis Eschscholtz,1833. Aleutian Islands to Socorro Island, Mex. Type locality, Sitka, Alaska.

This is one of the most abundant species on the coast and easily collected in any number from points above or near the tide line. The two varieties listed in Bull. 112, umbonata Reeve,1855 and textilis Gould,1846 are in my opinion of no consequence. A. oregona Reeve,1855 and strigillata Binney,1863 are also in the synonymy, we are informed in the opinion of Mrs. Test. It is certain that umbonata and textilis both intergrade and appear in every large lot taken.

Acmaea scabra (Gould),1846. (A. spectrum Auct.) Vancouver Island, B.C. south to Cape San Lucas. Type locality, San Francisco, Calif.

This common species with the rough radiating ribs should require no comments. However, there are specimens thatrequire so much study that a genuine problem is involved whether to place it in with A. digitalis or A. acabra. I may be in error but it is my opinion that a number of these species do actually intergrade. The habitat is high, above the tide line.

Acmaea conus Test,1945. Nautilus 58:92,93. Point Conception,Calif. to Cape San Lucas and the Revilla Gideo Islands. Type locality, Point Fermen, San Pedro, Calif.

The original description follows: " Apex near anterior third of shell, erect, highest point of shell. Lateral and anterior faces plane or slightly convex. Sculpturing of roughly rounded ribs, often branched, irregularly spaced,with a suggestion of spines near the apex. Interspaces usually wider at margin than ribs, and often finely corded in irregular fashion. Margin crenate due to slight projection of ribs. Surface of interior highly lustrous , with large brown " owl" filling apical area inside muscle scar; intermediate area white, with pencil lines from exterior often showing through; border irregularly marked with brown; muscle scar not conspicuous. External color pattern of ivory ribs alternating with interspaces tinged throughout with pale verdigris streaked with ramifying pencil lines of brown, the brown lines frequently forming a network, which near the apex often is stelliform. Soft parts of the animal with distinctive coloring, the side of the foot being white speckled with black pinhead dots (unlike that of any other species of Acmaea)on the wesy coast of North America except A. scabra, which is similar." Largest of type specimens 17.5 x 13.7 x 6 mm. high.

" The ribs may be sharply defined, smoothly rounded, and very narrow in comparison with the interspaces. They may be much lighter in color than the interspaces, which are frequently gray or dark. The ribs may be completely unbranched, and frequently have no suggestion of spines. The interior may be blue in the intermediate area, and the border may be dark interupted by white where the ribs are. The central area may be white. The external coloring may be of various patterns in gray between ivory ribs. Occasionally, the ribs also are gray. Sometimes the entire color pattern is obscured by the ravages of fungus infection."

The apparent difference at a glance is that the interior of conus is shiny whereas that os scabra is dull.

Acmaea limatula Carpenter,1864. Puget Sound to Maria Madre Island, Mex. also Gulf of Calif. as far north as Coronados Islands. (Test). Type locality not selected.

This is one of our most abundant species. The only difficulty in separating it is possible confusion with A. scutum in the young. It is necessary to put a glass on the ribs if they are in any way worn at times also. An interesting thing about limatula is the prevalence of albino specimens. Pure white or, rather cream colored specimens are common in all colonies along with the odd mixture of those with white blotches on them. Common on stones above tide mark.

The subspecies A. l. morchii Dall,1878 is in my opinion of no consequence. It is possible to select a set to fit the description of this high arched form from any large series of limatula. Of course, there are locations where this high arched form seems to predominate. The San Pedro breakwater is an excellent place to get a lot of limatula that you can label morchii (but be sure to throw out all of the flat ones you take with them.)

Subgenus ? / Panama(Reed)
Acmaea rosacea Carpenter,1864. Ketchikan, Alaska south to Acapulco,Mex.
Type locality, San Pedro, Calif.

Collecting data: Our experience has been to find this a moderately deep water species and never taken littoral. It is a very common small species in the dredgings from off Redondo Beach in 25 fms. gravel; Malaga Cove in 15 fms.; off Avalon, Catalina Island in 25 fms.; (Burch); off Coronado Islands, L.C. in 14 fmms.; off Ballast Point, San Diego: Magdalena Bay (Dr. F. Baker); Taboguilla Is., Panama- dredged (Reed); Guaymas in 20 fms. (Lowe); Monterey (Hemphill and Lowe); Imperial Beach (Randall); La Jolla (Bristol). (San Diego Museum). * Note* this species does come in with washed in kelp holdfasts.

Subgenus Rhodopetala Dall,1921. Type (by monotypy), Acmaea rosea Dall.

There is serious question about whether or not this belongs even in the family Acmaeidae. Its exact position is very doubtful. Perhaps we may receive some later information on it.

Acmaea rosea (Dall),1872. Kyska Island, Aleutians to the Shumagin Islands Alaska. Type locality, East side of Simeonoff Island, Shumagins.

The following notes on Acmaea are of interest:

Acmaea atrata Carpenter,1864. According to our data this is a Gulf of California and Lower Californian species. However, Dr. W.O. Gregg has two sets , one from Santa Monica and one from San Pedro that were identified by the late Dr. Dall as being this species. We question this record but it should be carefully investigated.

Acmaea conus Test,1945. Dr. A. Myra Keen calls attention to the following: " Acmaea conus Test,1945 was figured (but fortunately not validated with a description) by S.F. Light in 1941 in his " Laboratory and Field text in Invertebrate Zoology", a lithoprint publication sold at the Univ. of Calif. Associated Students store for $5.00. The figures are: pl. 12, figs. 20,30; pl. 13, fig.3; pl.14, figs. 5-6. They check well with the specimens Allyn Smith had."

Mr. W.J. Eyerdam reports on some of the species as follows:

Acmaea rosea Dall,1872. Izhut Bay, Afignak Island, 1922, rare; Sitkalidak Island, 1931, rare; Port Vita, Raspberry Island, 1945 .
Extended geographical range- Several hundred miles eastward to Kodiak Islands.

The following are species of Acmaea not included in your list that I have in my collection.

Acmaea patina Eschscholtz- Drier Bay, Knight Island, Alaska.
Acmaea spectrum Nuttall- San Pedro, Calif.
Acmaea pelta fimbriata Gould- Shuyak Strait, Afognak Island, Alaska,1924.
Acmaea pelta elevata- Puget Sound
Acmaea atrata Carpenter,1864- Piedras Blancas, Calif.
* Note*- Most of the above species were placed in the synonymy in our report given above..

Dr. W.O. Gregg contributed some comments on Acmaea. Most of the points raised are covered in our discussion above.

" Acmaea cassis Eschscholtz- If page priority meansa thing cassis stands and pelta is only a variety, subspecies or perhaps a synonym. Dall quoted the wrong page too but this was corrected by Oldroyd. Dall gives page 11 in Exchscholtz's Atlas but it should be page 19. On page 19 the following species are described in the following order,(4) A. cassis,(5), A. pelta (6) A. scutum, and (7) A. patina. In Nautilus 28:13-15, for no reason at all, Dall makes cassis a form of A. pelta. At least a reason not stated isas good as no reason at all. Do you have access to Carpenter's description of A. monticola? We used to call the form that grows on mussels A. c. monticola. Others call it nacelloides making no distinction from the form which grows on floating kelp. They certainly are distinct enough although obviously only situs forms doubtless also influenced by food supply. I am of the opinion that patina and pintadina should be placed in the synonymy with A. scutum. That Acmaea cassis hybrida thing is purely a situs form which got its start on either kelp or Mytilus and later moved to a rock and the later growth is like that of a normal A. cassis. I have specimens of this form which started on kelp and others which started on Mytilus californus (obviously) and then finished on rocks where I took them, all labelled Acmaea cassis hybrida Hemphill."

* Note* Most of the above questions were discussed on previous pages.

Genus Lottia Gray,1833. Dr A. Myra Keen advises on this genus as follows: " Lottia was described by Gray in 1833(Phil. Trans. R. Soc., pp. 774,800), but no species was mentioned by name. According to the International Rules, the first species assigned to such a genus becomes type. This would be Lottia gigantea Sowerby,1834 (Gen. Shells, no. 42, fig.1); as Sowerby included one or two other species in Lottia at the same time, perhaps we should consider the type as confirmed by subsequent designation of Dall,1871. Sowerby gave name and figure only, no locality."

" Shell patelliform, depressed, the apex anterior. The typical and only species is among the largest and most active of limpets, the shell attaining three inches in length"

Lottia gigantea Sowerby,1834. Crescent City, Calif. south to Guadalupe and Cerros Islands. Type locality not stated.

Collecting data: A very common species, largest of the group, found at or above high tide mark usually on cliffs and large stones exposed to the full surf of the open sea. I have never seen a specimen in an estuary or protected habitat. It seems to increase in size toward the southern end of the range producing giants in Lower California. We have exceptionally large specimens also from the islands especially San Clemente." (Burch) San Luis Obispo Co. (Lowe); San Nicholas Id. (Hemphill); N.E. Guadalupe I d (Huey); Ascunsion Id. (Huey); No. Coronados (F. Stephens); Turtle Bay ((Burgiss); Santa Barbara (Orcutt) (San Diego Museum);

Lottia gigantea albomaculata Dall,1910. Crescent City to Rosario Bay, Lower Calif. No type locality stated. Dr. Dall in Nautilus 24:96 gave the following which is complete and original description " Another shell which seemed particularly attractive, and which was new to me, was a variety of Lottis gigantea , which may be called albomaculata, offering, instead of the usual brown and grey upper surface, the feature of being spotted with rounded white maculations regularly disposed."

This is another color variety which may be collected from any series of Lottia. Anyone wishing to label some shells albomaculata may visit Malaga Cove , the San Pedro brwakwater or almost any rocky locality and this variety will be obvious among the more juvenile and protected specimens. I propose to put it in the synonymy of the typical. (Burch).

Family Cocculinidae

Genus Cocculina Dall,1882. Type (by subsequent designation, Dall,1908) Cocculina rathbuni Dall.

" Shell patelliform, apex posteriorly inclined, with a deciduous spiral nucleus; margin entire. The shell resembles that of the Patellidae, but the animal is more nearly allied to Fissurellidae." (Dall).

In Minutes #18, p.3, Mr. George Willett in discussing this genus commented as follows: " Lepeta is most common in from 10 to 30 fathoms, and Cacculina is known only from considerably deeper water. My specimens of Cocculina are from a depth of 70 fathoms in southeastern Alaska,and the only reason they were not discarded as young Acmaeas at the time of collection was because of my realization that Acmaea did not belong in that depth of water, particularly at such latitude. Two species of this genus are recor ed from the Atlantic Ocean and two more from the Pacific, all from deep water. "

Cocculina agassizii Dall,1908. Off Queen Charlotte Islands, B.C., 145 fms. Gulf of Panama,556 fms. (Dall).

Cocculina cazanica Dall,1919. Kasaan Bay and Stevens Passage,Alaska,95 to 160 fms. Type locality, Kasaan Bay, Alaska.

Family Phasianellidae

Genus Phasianella Lamarck,1804

The following list of species is from Mr. A.M. Strong's notebook.

P. (Tricolia) compta Gould,1855	Mugu Lagoon to San Diego Bay
P. (Tricolia) pulloides Carpenter,1865	Puget Sound to Gulf of Calif.
P. (Tricolia) perforata Philippi,1848	Peru- Nicaragua
P. (Eulitidium) substriata Carpenter,1864	San Pedro to Gulf of Calif.
P. (Eulitidium) rubrilineata Strong,1928	San Pedro to Todos Santos Bay
P. (Eulitidium) typica Dall,1908	Magdalena Bay to Cape San Lucas
P. (Eulitidium) cyclostoma Carpenter,1864	Cape San Lucas
P. (Eulitidium) mazatlanica Strong,1928	Mazatlan and West Mexico
P.(Eulitidium) phasianella C.B. Adams,1852	Panama to Ecuador
P.(Eulitidium) umbilicata d'Orbigny,1840	Bolivia and Peru

In discussion of the family name it is interesting to note that Woodring,1928 uses a family name Tricoliidae to include all American species from both coasts on the statement that Phasianella Lamarck,1804, embraces exotic species more than two times the size of any of the American species. However, Dr. W.P. Woodring (Per. Comm. Nov. 1945) states " I did not propose the family name Tricoliidae, but I do not remember where I got it. Differences between Phasianella and Tricolia involve more than difference in size. See Pilsbry, Manual Conch., vol. 10, pp. 162-164,1888."

Grant and Gale and others use the genus Tricolia Risso,1826, a practice which I had adopted. However, Mr. A.M. Strong in " West American Mollusca of the Genus Phasianella " , Proc. Calif. Acad. Sci. vol. 17, pp. 187-203, pl. 10, 1928 uses Phasianella with Tricolia as a subgenus. I am disposed to follow Strong if the principal difference between the two is size. We have giants and pygmies in other genera.

Genus Phasianella Lamarck,1804. Type (by original designation, Faisan (Buccinum australis Gmelin.) (Fide Woodring, 1928, p. 418.)

Subgenus Tricolia Risso,1826. Type (by subsequent designation, Gray, 1847), Turbo pullus Linnaeus.

" Shell small, ovate, body whorl inflated. Aperture broadly ovate. Outer lip thickened, abruptly angulated and slightly channeled where it meets callus on parietal wall. Umbilical opening reduced to a narrow trough like groove or virtually closed. Operculum calcareous, outer surface inflated, inner surface concave and bearing near its lower inner edge an eccentric spiral nucleus." (Woodring,1928, p. 418.).

Phasianella compta Gould,1855. Crescent City, Calif. (Burch) south to Gulf of Calif. Type locality, San Diego, Calif.

Collecting data: Crescent City, Calif.; Monterey; San Simeon; Cayucos; Mugu, Ventura Co/; Santa Monica, dredged in 10 fms ; San Onofre; Newport Bay ; very abunfant on the eel grass in Mission Bay; also very abundant in the Estero de Todos Santos Bay, L.C.; common in many of the Pleistocene deposits of San Pedro. (Burch); San Diego and San Pedro (Lowe).

Dr. Dall in Bulletin 112 and Mrs. Oldroyd following him list two sub-species of Phasianella compta..P. compta producta Dall,1908 is placed by Mr. Strong in the synonymy of the typical. P. compta punctulata Carpenter, 1865 is placed by Mr. Strong in the synonymy of P. pulloides Carpenter. We are following Strong in this matter.

Phasianella pulloides Carpenter,1864. Puget Sound to Cape San Lucas and the Gulf of California. Type locality on advise of Dr. Keen is Santa Barbara according to the holotype label.

(con.)

Collecting data: Our experience has been to find this species much larger and finer in comparatively deep water than compta and to find it rather rare in littoral collecting. We have such records as , off Malaga Cove in 15 fms.; off Avalon,Catalina Island in 25 fms.; off Rodondo Beach in gra v in 25 fms.¢ off Punta Banda in Todos Santos Bay; from the back of Haliotis rufescens brought up from about 25 ft. off Morro Bay, Calif.; from Pacific Grove, Calif. in 15 fms.; off Santa Cruz Island in 25 ft.; Of course, it is to be taken littoral all down the coast usually in algae.(Burch); Montefreyand Laguna Beach(Lowe); La Jolla (Orcutt and Bristol); San Diego (Hemphill).
Phasianella pulloides elatior Carpenter,1865 , type locality, Santa Barbara Calif. is placed in the synonymy of the typical by Mr. Strong.

Subgenus Eulithidium Pilsbry,1898. Type (by subsequent designation for Eucosmia, Pilsbry,1888), Eucosmia variegata Carpenter, (not P. variegata Lamarck) plus Tricolia substriata (Carpenter), variety typica. (Fide Grant and Gale), p. 814). However, Woodring, 1928, " Mio. Moll. Jam." p. 420 simplified this by stating Type (herewith designated)- Eucosmia variegata Carpenter. Therefore I assume that the proper statement should be (by subsequent designation, Woodring,1928).

Phasianella rubrilineata Strong,1928. Proc. Calif. Acad. Sci. 4th Ser. vol. 17, no. 6, p. 197, pl. 10, figs. 8,9,10, 1928. Type locality, Point Loma, San Diego Co. Range: Monterey to Todos Santos Bay. to San Martin Id.

According to Mr. Strong, California species that have been identified as typica are this species and the range of typica is southern from Magdalena Bay to Cape San Lucas. Phasianella typica (Dall),1906.

The extension of the range northward to Monterey is based upon a verbal statement made to me some time ago by Mr. Allyn G. Smith to the effect that they had taken this species from shore to 15 fathoms off Monterey. I tried to recognize it in our material and failed to do so.

The original description follows: " Shell minute, depressed turbinate, smooth, except for microscopic lines of growth ; whorls four, apex flattened, the succeeding whorls rapidly enlarging and well rounded; body whorl somewhat oblique; first two whorls whitish, third whorl clouded with white and brown or rose, often showing a few more or less distinct spiral lines of color, b body whorl with alternating oblique spiral lines of rose and white which grow narrower and closer spaced from the suture to the base, upper portion of the whorl often with large white blotches; aperture large,nearly circular, outer lip thin, somewhat flaring, the inner lip surface showing the color lines very distinctly; inner lip slightly flattened, umbilical groove broad, longitudinally striated. Operculum calcareous, outer surface convex, white, darkening toward the outer edge, which is microscopically subspirally striated. Height 2.1, diameter 1.9 mm."
Holotype: No. 2741, Mus. Calif. Acad. Sci. collected by A.M. Strong from Point Loma, San Diego Co., California, paratype; No. 2742, from Todos Santos Bay, Lower Calif., Henry Hemphill collection; paratype: no. 2743, from Point Fermin, San Pedro, Calif.

Specimens of this species were found in all the collections examined. Three specimens, No. 3310 in the Hemphill collection at the Academy, from Todos Santos Bay, Lower Calif. were marked " Phasianella rubrilineata Cpr. Types." As all three were dead shells a living specimen is picked for the type but the name, which does not seem to have been polished is retained.

(con.)

In the older collections the specimens of this species are usually labeled P. cyclostoma Carpenter, but they have more recently been identified as P. typica Dall. They differ from those species in the Cape San Lucas material in being smaller, more depressed, with a proportionately larger sperture and a distinctly different color pattern. They are easily distinguished from the young of P. pulloides Carpenter of the same size by the more prominent umbilicus, larger aperture and different color pattern.

Living specimens have been collected along the southern California coast from the smaller sea weeds in the tife pools, and dead shells are quite plentiful in the dredgings outside the kelp line. Additional localities from which specimens have been examined are Catalina Island, San Clemente I Island, Point Vicente and Point Fermin in southern California and South Coronado Island and San Martin Islands in Lower Calif.

Phasianella substriata (Carpenter),1864. Monterey, Calif. to Panama. Type locality, Cape San Lucas.

Collecting data: Our experience has been to find this an exclusively dredged shell from moderate depths. It is comparatively common off Redondo Beach in 25 fms. gravel and elsewhere, around Todos Santos Bay. It is not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch); off South Coronado Island in 10 fms. (Dr. F. Baker); San Pedro in 10 fms. (Love).

Phasianella lurida Dall,1897. Vancouver Island to Mendocino Co., Calif. (Dall). Type locality, Skidegate Channel, Queen Charlotte Islands in 20 fms.

Collecting data: Crescent City, Calif. (W.P. Chace).

Family Turbinidae

Genus Astraea Roeding,1798. Type (by subsequent designation) Suter,1 1913), Trochus imperialis Gmelin) = Trochus heliotropium Martyn) ; Recent New Zealand.

Subgenus Pomaulax Gray,1850. Type, Trochus undosus Wood.
" Shell large, conic, solid, imperforate; periphery carinated; base flattened; umbilical tract with a strong, curved rib; operculum obovate, narrower toward the proximal extremity, nucleus terminal, outside with four strong granulose ribs radiating from the nucleus." (Pilsbry).

Grant and Gale state of this " This subgenus is readily distinguished from Astraea s.s. by its imperforate axis, whereas the typical subgenus is widely umbilicate. Pachypoma Gray differed in its long and very convex operculum and the absent or very obscure semicircular rib in the umbilical region." * Note* " The earliest type designation for Pomaulax was of Cossmann,1918: Trochus japonicus Dunker. " (Dr. A.M. Keen).

Astraea undosa (Wood),1828. Mugu Lagoon, Ventura Co. to Cerros Island, L.C. Type locality, California.

Collecting data: An interesting thing in our experience with this species has been that we have found it a shallow water species in Santa Monica Bay with the A. inaequalis in deeper water. Perhaps the largest individual specimen we ever collected came from about 10 fathoms off Avalon, Catalina Island. The most abundant locality for the species in our experience was Punta Banda, L.C. on the far side of Todos Santos Bay in October,1936. They were literally so thick it was difficult to stop and not hit one. We have found them in the estuaries as well as the open sea. They seem to be seasonal in coming in in great numbers although our records show that we have collected them in almost every month of the year. (Burch)

(continued bottom of Page 21)

Family Turbinidae

The following keys and notes are from Mr. A.M. Strong's notebook.

Base flattened or concave .... Astraea
. Operculum oval
.. Outside of operculum with 3 spiral ribs ....(Pomaulax)
... Periphery with an undulated spiral rib
Diam. 110 mm Mugu Bay to Cerros Island .... undosa
... Periphery with 2 rows of nodules
Diam. 41 mm. Magdalena Bay ....turbanica
.. Outside of operculum with 2 spiral ribs ....(Uvanilla)
... Periphery with about 16 rounded projections
Gulf of Calif. to Panama .... unguis
... Periphery winged and armed with vaulted projections.
.... Umbilical region white
Gulf of Calif. to Peru .... buschii
.... Umbilical region orange-red
Gulf of Calif. to Panama ....olivacea
Operculum oblong, very convex ....(Pachypoma)
.. Spire with 3 spiral grooves cutting the axial ribs
... Axial ribs on body whorl about 70
Diam. 60 mm. British Columbia to San Diego ...... inaequalis
... Axial ribs on body whorl about 30
Diam. 37 mm. Santa Cruz Island .... barbarensis
... Axial ribs on body whorl about 20
Diam. 31 mm. Gulf of Calif. .... spirata
.. Spire with 4 spiral grooves cutting the axial ribs
Diam. 38 mm. Magdalena Bay .... magdalena
.. Spire with alternating beaded spiral cords
Diam. 36.5 mm. Cerros Island .... lithophora
Base rounded, convex
. Shell large, outer surface of operculum convex .... Turbo
.. Outer surface of operculum smooth ....(Turbo)
... Sculptured with spiral rows of elevated scales
Diam. 25 mm. Gulf of Calif. to Peru .... squamiger
... Sculpture fine or obsolete
.... Columella with a longitudinal rib
Diam. 30 mm. Peru to Magellan Strait .... niger
.... Columella simple
..... Shell large, delicately axially striate
Diam. 170 mm. Ecuador to Peru .... magnificus
..... Shell small, obsoletely spirally striate
Diam. 12 mm. Chile .... elevatus
. Shell large, outer surface of operculum convex
.. Outer surface of operculum spirally grooved .... (Callipoma)
... Surface sculptured with nodose spiral ribs
Diam. 65 mm. Gulf of Calif. to Peru .... fluctuosa
... Surface roughened by axial and spiral laminae- subsutural tubercles
Diam. 50 mm. Gulf of Calif. to Peru .... saxosa
. Shell small, operculum concave with a raided margin ...Homolapoma
.. Sculptured with fine spiral striae
Diam. 5 mm. Puget Sound to San Martin Island .... bacula
.. Sculptured with distinct spiral threads
... Body whorl with about 15 subequal spirals
.... Interspaces equally the threads in width
Diam. 9 mm. Alaska to Cape San Lucas .... carpenteri

(con.).

.... Interspaces narrower than the threads
Puget Sound to Cape San Lucas .... lurida
... Body whorl with about 12 wide spaced spirals
Diam. 9 mm. San Diego to Tia Juana .... juanensis
... Body whorl with about 8 strong spirals
Diam. 5 mm. Monterey to Coronado Islands ...... paucicostata
... Body whorl with 5 major and many minor spirals
Diam. 6 mm. San Diego .... grippi
... Body whorl with 3 major and many minor spirals
Diam. 11 mm. Bay of Panama .... panamensis

Genus Turbo Linnaeus,1758
Turbo (Senectus) squamiger Reeve,1842 Gulf of Calif. to Peru
Turbo (Callopoma) fluctuosus Wood,1828 Gulf of Calif. to Peru
Turbo (Callopoma) magnificus Jonas,1847 Ecuador to Peru
Turbo (Callopoma) mazatlanicus Pilsbry & Lowe,1932 Gulf of Calif.
Turbo (Callopkma) niger Wood,1828 Peru and Chile
Turbo (Callopoma) saxosus Wood,1828 Gulf of Calif. to Peru
Genus Astraea Roeding,1798
Astraea (Pomaulax) turbinicus Dall,1910 Magdalena Bay
Astraea (Pomaulax) undosus Wood,1828 Mugu Lagoon to Cerros Island
Astraea (Pachypoma) barbarensis Dall,1919 Santa Cruz Island
Astraea (Pachypoma) inaequalis Martyn,1784 Vancouver to San Diego
Astraea (Pachypoma) magdalensis Dall,1910 Magdalena Bay
Astraea (Pachypoma) spirata Dall,1919 Gulf of Calif.
Astraea (Uvanilla) babelis Fischer,1874 Ecuador
Astraea (Uvanilla) brevispinus Lamarck,1822 Atlantic ? Panama
Astraea (Uvanilla) bushii Philippi,1844 Gulf of Calif. to Peru
Astraea (Uvanilla) olivaceus Wood,1828 Gulf of Calif. to Ecuador
Astraea (Uvanilla) unguis Wood,1828. Gulf of Calif. to Panama
Genus Homolapoma Carpenter,1864
Homolapoma bacula Carpenter,1864 Puget Sound to San Martin Island
Homolapoma carpenteri Pilsbry,1888 Sitka to San Martin Island
Homolapoma conceptionis Lowe Gulf of Calif.
Homolapoma cunninghami Smith,1881 Chile
Homolapoma grippi Dall,1911 San Diego
Homolapoma juanensis Dall,1919 San Diego to Tia Juana
Homolapoma lurida Dall,1885 Puget Sound to Cape San Lucas
Homolapoma panamensis Dall,1908 Panama
Homolapoma paucicostata Dall,1871 Monterey to San Martin Island

Continued from page 19-

Subgenus Pachypoma Gray,1850. Type (by subsequent designation,Pilsbry 1888), Trochus inaequalis Martyn.

" Shell similar to Pomaulax, but umbilical area scarcely ribbed and operculum small, externally very convex, white and smooth, with a broad central convexity and obscure, narrow side ribs."

Astraea gibberosa Dillwyn,1817. (Astraea inaequalis (Martyn)
Vancouver Island, B.C. to San Diego, Calif.

The substitution of the above name for our familiar inaequalis Martyn has been adopted after considerable discussion and by no means agreement. Dr. Joshua L. Baily Jr. is in favor of retaining the Martyn names as long as possible. However, if they must be abandoned the sooner we start getting the next available names the better off we will be. Dr. A. Myra Keen writes

(con.)

on this matter (Per. Comm. Nov. 1945) " If we are to abandon Martyn's names and I am convinced Martyn is, as Winckworth says, both non-binomial and non-binominal, we must find a substitute for Astraea inaequalis. The first available substitute seems to be A. gibberosa Dillwyn,1817 (Desc. Cat. Recent Shells, vol. 2, p. 803). Based on Trochus gibberosus Chemn. vol. 10, p. 287; Martyn Univ. Conch. pl. 31; Favanne, vol. 2, p. 13. Type loc.: Zew Zealand and Friendly Islands (the latter is Martyn's locality, obviously wrong). Dillwyn's description: " Shell conical, with oblique plaits on the upper part, a transverse row of tubercles below, and the margin of the whorls spinous. Shell about an inch and 3/4 long, and two inches broad, of an olive or greenish or reddish brown colour.."

Collecting data: We have found this species comparatively common from Monterey south to off Redondo Beach, Calif. in about 35 fathoms. We dredged any number of them off Monterey in all depths from very shallow down to approximately 40 fathoms. Among the various lots we have collected including those from off Redondo Beach it is my opinion that it would be possible to select all of the specimens you wished to fit the descriptions of the subspecies pacifica Dall,1919 which I propose to place in the synonymy of the typical following Grant and Gale and others. The subspecies montereyensis Oldroyd 1927 (Stanford Univ. Publ. Geol. Sci. vol. 2, pt.3, p165,166. Type locality Monterey. I have taken perhaps several hundred specimens of this species from Monterey Bay and have never been able to detect the slightest difference between any of them and a similar lot from anywhere else. It is my opinion that montereyensis is also properly placed in the synonymy.

Astraea barbarensis Dall,1919. Off Santa Cruz Island, Calif. in 30 fms.

Genus Homalopoma Carpenter,1864. (Leptothyra Dall) Type (by monotypy), Turbo sanguineus Linnaeus.

" Shell small or minute, globose, depressed, solid, compact; umbilicate or imperforate; whorls 3-7 spirally sculptured, the last generally somewhat deflexed at the aperture; aperture subcircular, white and nacreous within; columella generally but not always bluntly denticulate near the base. Operculum subcircular, nearly flat or concavo-convex, inside with a very thin corneous layer, slightly convex, with many gradually increasing whorls, the nucleus subcentral; outside calcareous, subspiral, with a slightly convex concentric elevation or ridge around the margin, most prominent at its termination, the middle portion concave and more or less rugose." (Pilsbry)

Homalopoma carpenteri (Pilsbry),1888. Sitka Sound, Alaska to San Martin Island, L.C. Type locality, California.

Collecting data: In our experience one of the commonest of small littoral shells from Monterey to Mexico. We have also brought it up in the dredges from some rather surprising depths. It is common as deep as 25 fathoms off Redondo Beach with some as deep as 50 fathoms, always from rock or gravel bottom. Dredged off Catalina Island in 35 fathoms. (Burch); Forrester Island (Willett); Monterey (Hemphill and Lowe); Cayucos (Wilcox); San Pedro and Laguna Beach (Lowe); La Jolla (Bristol); Redondo (Kate Stephens) (San Diego Museum).

Homalopoma luridum (Dall),1885. Puget Sound to Cape San Lucas. Type locality, on advice of Dr. A.M. Keen " San Diego, according to holotype label in the U.S.N.M.".

Collecting data: Puget Sound (W.J. Eyerdam); San Juan Island,P.S. (Lowe); La Jolla (Beckwith); Imperial Beach (Kate Stephens) (San Diego Museum).

Homalopoma baculum (Carpenter),1864. Puget Sound to San Martin Island. Type locality, Catalina Island, Calif.

Collecting data: Our experience has been to find this smooth species with carpenteri in southern California and Todos Santos Bay littoral/ We did not recognize it from Monterey Bay. Our records read Malaga Cove southward. (Burch); Monterey (Hemphill); San Pedro (Lowe); San Martin Island (Dr. F. Baker); So. Coronado Island (Kelsey) (San Diego Museum).

Homalopoma paucicostatum (Dall),1871. Monterey south to San Martin Island (Baker) and to Guadalupe (Strong and Hanna). Type locality, Monterey.

Collecting data: Dredged off Monterey, Calif. in 10-15 fathoms; off Redondo Beach in 50 fathoms north side of the canyon. Our experience has been to find this a deepwater species never having recognized it in littoral collecting. (Burch); San Pedro (Hemphill); La Jolla (Chaney,Wilson and Bristol); Pt. Loma (Dr. F. Baker); So. Coronado Island in 16 fms. (Baker) .

Homalopoma paucicostatum fenestratum (Bartsch),1919. Monterey to Coronado Islands. Type locality on advice of Dr. A.M. Keen " Monterey on holotype label."

Grant and Gale state " Typical paucicostatum (Dall) is readily distinguished by its few, prominent, spiral ribs. However, a series of specimens obtained by Mr. George Willett from off Catalina Island seems to include specimens intermediate between paucicostatum and carpenteri, and it is possible that the difference between these two shells is varietal rather than specific."

Homalopoma juanensis (Dall),1919. San Diego, Calif. to Tia Juana, L.C. Type locality, Tia Juana, L.C.

Homalopoma grippi (Dall),1911. San Diego, Calif. in 100 fathoms. to Catalina Island in 50 fathoms.

Collecting data: Catalina Island in 50 fms. (Lowe).

Homalopoma engbergi (Willett),1929. Type locality, Olga, Wash.and known only from the type locality. Nautilus 43:27,28, pl.3; fig.4,1929. Original description follows: " Shell small, globose, solid, either perforate or imperforate; whorls convex, marked by thread-like spiral riblets which are rendered minutely nodulous by the intersection of the growth lines. On the last whorl there are about thirty of these riblets. Aperture about half the height of the shell, almost circular, white to bluish white within. Outer lip rather thin; inner lip thickened. Columella arcuate, flattened, without teeth. Color of shell dark brown to dull black in unworn specimens. Operculum of several whorls, shelly, concave, with nucleus a little anterior to the center and considerably nearer to the columella than to the outer lip. Alt. 3.3 mm. diam. 3.2 mm.. Type No. 1017 Collection Los Angeles Museum. Paratypes in collections of Dr. Engberg and the writer. The type and many additional specimens were collected by Dr. Carl C. Engberg at Olga, Wash. This well marked little shell is perhaps nearer to L. bacula Cpr. than to any other known species of west American Leptothyra. It differs markedly from t that species however, in much smaller size, difference in coloration, lack of columellar teeth, and in the fact that it is often perforate. Of 28 specimens sent in by Dr. Engberg, 20 are perforate in greater or less degree, and the remaining imperforate."

Family Liotidae

The following keys and lists are from Mr. A.M. Strong's notebook.

Surface latticed with equal axial ribs and spiral cords .... Liotia
Surface not latticed
. Periphery with smooth or nodulous spiral cords or keels ...... Arene

Genus Liotia

Shell 4 mm. or more in diameter
. Shell turbinate, with the spire elevated
Diam. 8 mm. Peru and Chile .... cancellata Gray
. Shell depressed, with flattened spire
Diam. 4 mm. Monterey to Gulf of Calif. .... fenestrata Carpenter
Shell 1 mm. in diameter or less
Diam. 0.6 mm. Mazatland.......................c-b-adamsi Carpenter

Genus Arene

Entire surface roughened by axial lines
. Spiral sculpture of 2 or 3 major spiral cords
.. Finer spiral striae present
... Fine spiral striae present over entire surface
Diam. 4.7 mm. Magdalena Bay to Tres Marias Islands ... rammata Dall
... Spiral striae absent between keels
Diam. 3.6 mm. Panama .... balboai S. & H.
.. Finer spiral striae absent
... Spiral keels on body whorl 2
Diam. 2 mm. Galapagos Islands ....scitula Dall
... Spiral keels on body whorl 3
Diam. 1 mm. Mazatlan .... striulata Carpenter
. Spiral sculpture of numerous, more or less nodulous cords
.. Whorls strongly shouldered
... Base with 3 nodulous spiral cords
Diam. 6 mm. Socorro Island .... socorroensis Strong
... Base with 4 nodulous spiral cords
Diam. 5.5 mm. Gulf of California .... carinata Carpenter
.. Whorls not strongly shouldered
... Base with 7 spiral cords
.... Cords on periphery undulated, not beaded
Diam. 6.2 mm. Panama .... olivacea Dall
.... All spiral cords beaded Panama ....var. litharia Dall
... Base with 5 tuberculate spiral cords
.... Spire moderately elevated
Diam. 8 mm. Nicaragua .... winslowae Pilsbry & L.
.... Spire depressed
Diam. 7.7. mm. Manzanillo,Mexico ....hidsiána Pils. & Lowe
Axial sculpture absent or confined to interspaces between spiral keels
. Spiral sculpture on body whorl of 6 to 9 keels
.. Spiral sculpture on body whorl of 6 keels
... Interspaces between keels smooth
Diam. 3 mm. Monterey to Tres Marias Islands ....acuticostata Carp.
... Interspaces between keels with axial threads
Diam. 3 mm. Monterey to Gulf of Calif. ......var. bristolae Baker
.. Spiral sculpture on body whorl of 9 keels
Diam. 2 mm. Panama .... heimi S. & H.
. Spiral sculpture on body of 20 or more cords
.. Axial sculpture present
Diam. 2 mm. Panama .... erici S. & H.

(con.)

.. Axial sculpture absent
Diam. 1.6 mm. Cape San Lucas .... lucasensis Strong

Peripheral nodes 6, blunt, rounded
Diam. 23 mm. Lower California .... californica Dall
Peripheral nodes 8, flattened, spinose
Diam. 15 mm. Gulf of California .... pacis Dall

Family Liotidae

Shells small,turbonate, with a thickened, continuous outer lip and open umbilicus. The operculum is corneous, multispiral, with an outer layer of calcareous pearly grains" (Strong).

Genus Liotia Gray,1847 Type (by original designation) Delphinula cancellata Gray.

" The shells placed in Liotia s.s. have the surface deeply pitted between strong axial ribs and spiral cords." (Strong).

Liotia fenestrata Carpenter,1864	Monterey to San Martin Island
Liotia c-s-adamsi Carpenter,1857	Mazatlan
Liotia cancellata Gray,1826	Peru and Chile

Genus Arene H. & A. Adams,1854. Type (by subsequent designation), Turbo cruentata Megerle von Muhlfield.

" In Arene the spiral sculpture is distinct while the axial sculpture is absent or reduced to fine lines, in some species giving the surface a scaly effect." (Strong).

Arene acuticostata Carpenter,1864.	Monterey to Gulf of California
var. bristolae Baker,1929	San Pedro to Gulf of Calif.
var. stearnsii Dall,1918	Gulf of Calif.
var. supranodosa Strong,1933	Gulf of Calif.
Arene rammata Dall,1918	Cape San Lucas
Arene lucasensis Strong,1933	Cape San Lucas
Arene carinata Carpenter,1857	Gulf of Calif.
Arene striulata Carpenter,1857	Mazatlan
Arene hindsiana Pilsbry & Lowe,1932	Manzanillo
Arene winslowae Pilsbry & Lowe,1932	Nicaragua
Arene olivacea Dall,1918	Panama
var. litharia Dall,1918	Panama
Arene socorroensis Strong,1933	Socorro Island
Arene scitula Dall,1919	Galapagos Islands
Arene erica Strong & Hertlein	Panama
Arene balboae Strong and Hertlein	Taboga Island, Panama
Arene heimi Strong and Hertlein	Taboga Island, Panama

Liotia (?) californica Dall,1908	Cerros Island
Liotia (?) pacis Dall,1908	Gulf of Calif.

Family Liotidae

" Shells small, turbonate, with a thickened, continuous outer lip and open umbilicus. The operculum is corneous, multispiral, with an outer layer of calcareous pearly grains." (Strong).

Two rather important references on this grpup follow:
Strong, A.M. " West American Species of the Genus Liotia", Trans. San Diego Society Nat. Hist., vol.7, no. 37, pp. 429-452, pls. 28-31, May 31,1934.
Pilsbry, H.A. " Notes on the Gastropod Genus Liotia and its Allies", Proc. Acad. Nat. Sci. of Phila., vol. 85, pp. 375-381, pl. 13, March 3,1934

It is interesting to note that Thiele put Homalopoma (Leptothyra in his use) in the subfamily Liotinae of the family Turbinidae.

Genus Liotia Gray,1847 Data given above.

Liotia fenestrata Carpenter,1864. Monterey, Calif. to San Martin Island, (L. cookeana Dall,1918 in synonymy). Type locality-on advice of Dr. Keen " Santa Barbara Island on holotype label).

Collecting data: Dredged off Redondo Beach in 25 fms. gravel- rather common; off Avalon, Catalina Island in 25 fms.; off Malaga Cove in 10 fms. (Burch);

Genus Arene H. & A. Adams,1854. Type (by subsequent designation, Woodring,1928), Turbo cruentatus Megerle von Muhlfeld.

" Shell small or medium sized, spire moderately low, Turreted, umbilicus narrow. Aperture circular, oblique. Peristome thick, continuous, attached to parietal wall for only a short distance. Sculpture consisting of spiral threads bearing scales." (Woodring,1928, Carnegie Inst. Wash., p. 422).

Arene acuticostata (Carpenter),1864. Monterey, Calif. to Tres Marias Islands Type locality,Catalina Island, Calif.

Collecting data: Dredged off Redondo Beach in 25 fms. gravel; off Avalon,Catalina Island in 25 fms.; Dana Point, Orange Co.; La Jolla; Punta Banda, L.C. (Burch); No. Coronado Island (Frank Stephens); La Jolla (Chaney Sweet, Bristol); Catalina Island (Hemphill) San-Pedro (Lowe) (San Diego M.)

Arene acuticostata bristolae (Baker),1929. Nautilus 43:72,1929 (now name for L. a. radiata Dall). San Diego to La Paz and Gulf of Calif. Type locality, off South Coronado Island.

Collecting data: La Jolla (Chaney,Sweet, Orcutt); San Pedro and Monterey (Lowe) (San Diego Museum).

Genus Molleria Jeffreys,1865. Type (by monotypy), Molleria costulata (Moller). " Shell remarkably solid, with strong and partly dichotomus transverse ribs; peristome continuous. Operculum calcareous, multispiral. (Tryonand Pilsbry, Man. of Conch.).

Molleria drusiana Dall,1919. Amchitka Island to Glacier Bay, Alaska. Type locality, Constantine Harbor, Amchitka Island, Aleutians.

Collecting data: Shuyak Strait, Afognak Island, Alaska, 1924: Raspberry Strait, Raspberry Island, Alaska,1945- under stones at low tide. (Euyerdam).

Molleria quadrae Dall,1897. Amchitka Island, Aleutians to Queen Charlotte Islands, B.C. Type locality, Queen Charlotte Islands, B.C.

Collecting data: Izhut Bay , Afognak Island, 1932; Raspberry Strait, Raspberry Island 1945 under stones. (W.J. Eyerdam).

Family Trochidae
The following keys and lists are from Mr. A.M. Strong's notebook.

Columella ending in a green callus surrounding the umbilicus..*Norrisia*
Columella twisted
. Columella with two folds .... *Turcisa*
. Columella with from 1 to 3 denticles .... *Tegula*
Columella simple, not twisted
. Columella excavated and flattened ....*Monodonta*
. Columella not excavated
.. Umbilicus closed or reduced to a chink
... Shell conical, base flattened .... *Calliostoma*
... Shell turbinate or globosely conical .... *Turcicula*
... Shell cylindrical in the adult ....*Halistylus*
.. Umbilicus wide and open
... Inner lip raised or reflected
.... Umbilicus marginated, funnel shaped .... *Solariella*
.... Umbilicus not marginated ....*Cidarina*
... Inner lip indistinct
.... Columella ending in a slight swelling .... *Gibbula*
.... Columella curving evenly into the basal lip ......*Margarites*
.. Base with a false umbilicus ....*Clanculus*

Genus *Norrisia*
Shell orbicular, thick, nearly smooth, chestnut brown
Diam. 40 mm. California to Cerros Island .... *norrisii*
Genus *Turcica*
Shell conical, blackish, with tuberculate spiral ribs
Diam. 16 mm. Redondo to Cape San Lucas .... *caffea*
Genus *Tegula*
Umbilicus closed
. Base flattened or concave
.. Surface sculptured
... Strong axial plications present
Diam. 35 mm. Catalina to Magdalena Bay................ *regina* Stearns
... Granular spiral cords present
Diam. 40 mm. Gulf of Calif. to Panama ...... *pelliserpentis* Wood.
.. Surface smooth except for lines of growth
... Shell uniformly yellowish brown
Diam. 35 mm. Mendocino Co. to Monterey .... *brunnea* Philippi
... Shell uniformly lusterless black
.... Shell large, 40 mm. or more in diameter
Peru and Chile .... *atar* Lesson
.... Shell small, not over 25 mm. in diam.
Peru and Chile ....*moesta* Jonas
. Base rounded, convex
.. Sculpture present, fine
... A narrow puckered band below the sutures
Diam. 35 mm. Vancouver to Cerros Island .... *funebrale* A. Adams
... Subsutural band present
Diam. 35 mm. San Francisco to Gulf of Calif. .... *gallina* Forbes
.. Sculpture absent Chile ....*gaudichaudii* Hupe
Umbilicus open
. Axial sculpture present
.. Periphery strongly angulated
Diam. 40 mm. Bolinas Bay to Santa Barbara ......*montereyi* Kiener
(con.).

.. Periphery not strongly angulated

... A spiral row of tubercles below the sutures

Diam. 25 mm. Chile ....melaleuca Jonas

... Sculpture not tuberculate

.... All whorls spirally sculptured

Diam. 21 mm. Gulf of Calif. .... rufotincta Carpenter

.... All whorls not spirally sculptured

..... Spiral sculpture obsolete on lower whorls

Diam. 35 mm. Santa Barbara to Magdalena Bay .....aureotincta Forbes

..... Spiral sculpture confined to the base

Diam. 27 mm. San Diego to Acapulco .... rugosa A. Adams

Umbilicus open

. Axial sculpture absent

.. Distinct spiral keels present

... Periphery with a single spiral keel

.... Spiral keels nodulous

..... Spiral keels four

Diam. 25 mm. Peru and Chile .... quadricostata Wood

..... Spiral keels 1 or two on spire, 5 on base .... mariana Dall

Diam. 12 mm. Santa Barbara to Peru

.... Spiral keels not nodulous

Diam. 40 mm. Peru and Chile ....luctuosa d'Orbigny

...Periphery with 2 spiral keels

Diam. 20 mm. Gulf of Calif. to Chile ....rubroflammulata Koch

.. Spiral keels absent

... Spiral sculpture of numerous cords

.... Cords distinctly granular

..... Columella with a basal and median dentical

...... Columella and umbilicus white

Diam. 20 mm. Monterey to Acapulco .... ligulata Menke

...... Columella and edge of umbilicus green

Diam. 20 mm. San Pedro to Panama ....reticulata Wood

..... Columella with a basal dentical only

...... Last whorl carinated at the periphery

Diam. 8 mm. Gulf of Calif. ....globula Carpenter

...... Last whorl rounded at the periphery

Diam. 15 mm. Peru and Chile ....patagonica d'Orbigny

.... Cords not distinctly granular

..... Cords distinct over entire surface

...... Columella with a median dentical

Diam. 20 mm. Panama to Peru .... panamensis Philippi

...... Columella without a median dentical

.... Spiral cords equal

Diam. 13 mm. San Diego to Tres Marias Islands.... impressa Jonas

.... Spiral cords unequal

Diam. 15 mm. Galapagos .... snodgrassi P. & V.

..... Cords distinct on base only

Diam. 25 mm. Peru .... smithii T. & G.

... Spiral sculpture of fine striae or absent

.... Fine spiral striae present

..... Periphery strongly angulated

Diam. 30 mm. Sitka to Santa Barbara .... pulligo Martyn

..... Periphery rounded, not angulated

...... Spiral striae numerous

Diam. 15 mm. Peru and Chile ....fuscescens Philippi

(con.)

...... Spiral striae few, delicate
Diam. 8 mm. Galapagos .... *cooksoni* E.A. Smith
Umbilicus open, continued
. Axial sculpture absent
.. Spiral keels absent
... Spiral sculpture of fine striae or absent
.... All sculpture absent
..... Umbilicus wide, funnel shaped
Diam. 45 mm. Peruand Chile ....*euryomphala* Jonas
..... Umbilicus small, circular
Diam. 20 mm. Peru and Chile ....*tridentata* P. & M.

The following are not placed; *T. coronulata* C.B. Adams, *C. lugubris* and *T. californica* A. Adams.

Genus *Monodonta*
Lip black marginated
Diam. 25 mm. Peru and Chile .... *crusoeana*
Lip not black marginated
Diam. 25 mm. Peru and Chile ....*nigerrima*
Genus *Turcicula*
Spire with 3 spiral series of nodes
Diam. 42 mm. Bering Sea to San Clemente Island ..... *bairdii* Dall
Spire with a single spiral series of nodes
Diam. 60 mm. Panama .... *macdonaldi* Dall
Genus *Halistylus*
Surface with close spiral striae
Length 9 mm. British Columbia to Panama ....*subpoideus* Tryon
Genus *Gibbula*
Sculpture of about 6 smooth spiral cords
Diam. 4 mm. Monterey to San Diego .... *canfieldi* Dall
Genus *Calliostoma*
Umbilicus more or less open
. Shell depressed, apex rounded
Diam. 16.6 mm. Gulf of Calif. ....*rema* Baker,Hanna &Strong
Umbilicus always closed
. Periphery angulated
.. Sides of whorls flattened or slightly concave
... Body whorl with 5 or 6 major spiral cords
Sitka to San Diego .... *canaliculatum* Martym
... Body whorl with numerous fine spirals
.... Basal cords about 12
Diam. 20 mm. Panama ....*iridium* Dall
.... Basal cords about 20
Diam. 22 mm. Panama ....*nepheloide* Dall
.. Sides of whorls flattened or concave
... Sides of whorls angulated near the middle
.... Body whorl with 3 to 5 spiral cords
..... Spiral cords nearly equal
Diam. 10 mm. Peru and Chile ....*fonki* Philippi
..... Spiral cords distinctly unequal
Diam. 6 mm. Monterey to San Diego .... *splendens* Carpenter
.... Body whorl with 15 or more spiral cords
..... Spiral cords smooth
Diam. 22 mm. Gulf of Calif. ....*bonita*,baker,Hanna and Strong

(con.)

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..... Spiral cords granular
Diam. 15 mm. Gulf of California ....palmeri Dall
... Sides of whorls rounded
.... Spiral cords equal in strength
..... Spiral cords fine and numerous
Diam. 22 mm. San Francisco to San Diego .....gloriosum Dall
..... Spiral cords few but strong
...... Body whorl with 5 spiral cords
Diam. 12.5 mm. Point Conception to San Diego... turbinum Dall
...... Body whorl with 7 to 9 spiral cords
Diam. Forrester Island to San Diego........annulatum Martyn
.... Spiral cords unequal in strength
..... Spiral cords in two sized
...... Body whorl with 2 or 3 major spiral cords
.... Entire surface tuberculate
Diam. 8 mm. Gulf of Calif. .... macandrae Carpenter
.... Entire surface granular
Diam. 8 mm. Panama ....leanus Carpenter
...... Body whorl with 4 or 5 major spiral cords
Diam. 7.5 mm. San Pedro to San Diego ....supragranosum Carpenter
..... Spiral cords in 3 sizes
Diam. 25 mm. Gulf of Calif. to Panama .....lima Philippi
. Periphery rounded or flattened
.. Sides of whorls flattened or slightly concave
... Body whorl with 3 to 5 major spiral cords
Diam. 25 mm. Puget Sound to Cerros Island ....variegatum Carpenter
... Body whorl with 8 spiral cords in 3 sizes
Diam. 23 mm. Santa Barbara to Panama ....antonii Koch
.. Sides of whorls not flattened or concave
... Sides of whorls angulated near the middle
.... Body whorl with 3 to 5 major spiral cords
Diam. 12 mm. Santa Cruz to San Diego .... tricolor Gabb
.... Body whorl with 15 or more spiral cords
Diam. 23 mm. Catalina to Gulf of California .. eximium Reeve
... Sides of whorls rounded, not angulated
.... Body whorl with a single spiral cord
Diam. 32 mm. Farallones to San Diego .... platinum Dall
.... Body whorl with more than one spiral cord
..... Spiral cords unequal in strength
...... Body whorl with 3 major spiral cords
Diam. 15 mm. San Pedro to Gulf of Calif. ... gemmulatum Carpenter
...... Body whorl with 6 major spiral cords
Diam. 12 mm. Gulf of Calif. ....gemmuloides Lowe
..... Spiral cords about equal in strength
...... Body whorl with 7 to 9 spiral cords
Diam. 18 mm. Sitka to San Diego .... costatum Martyn
...... Body whorl with about 13 spiral cords
.... Base with 20 spiral cords
Diam. 13.5 mm. Gulf of Calif. .... marshalli Lowe
.... Base with 16 spiral cords
Diam. 13 mm. Gulf of Calif............... angelenum Lowe

Genus Solariella

All sculpture obsolete
Diam. 19 mm. Monterey to Clarion Island .... nuda Dall
Sculpture distinct
• Spiral of fine threads
•• Axial sculpture of narrow, threadlike ribs
Diam. 2 mm. Catalina Island ....rhyssa Dall
•• Axial sculpture of numerous, oblique ribs
Diam. 6 mm. Arctic to San Diego .... varicosa M. & H.
• Spiral sculpture of prominent rows of keels
•• Axial sculpture present, fine
Diam. 8 mm. Forrester Island to San Diego .....peramabilis Carpenter
•• Axial sculpture absent
••• Spire with three strong spiral cords
Diam. 7 mm. San Diego to Panama ....triplostephana Dall
••• Spire with six major spiral cords
Diam. 15 mm. Galapagos ....galapagana Dall

Genus Cidarina

Spire with several major, equal spiral cords
Height 40 mm. Alaska to Cape San Quintin .....cidaria A. Adams
Spire with only two major spiral cords
• Spire with 2 minor cords in addition to the major
Height 21 mm. San Diego to Ecuador .... equatorialis Dall
• Spire without minor spiral cords
Height 28 mm. San Diego to the Gulf of Calif. ..ceratophora Dall

Genus Clanculus

Sculpture of 6 or 7 major and numerous minor spirals
Diam. 15 mm. Gulf of Panama ....rubidus Dall

Genus Margarites

Surface smooth or nearly so
• Shell depressed, surface bright and shining
Diam. 8 mm. Bering Sea to Catalina .... helicina Phipps
• Shell globose conical, surface dull
Diam. 3 mm. Puget Sound to San Diego .... lacunata Carpenter
Spire with 2 major and many minor spiral cords
• Base with 5 spiral threads
Diam. 3.5 mm. Alaska to San Diego ....parcipicta Carpenter
• Base smooth or with fine spiral striae
Diam. 5 mm. Alaska to San Diego ....lirulata Carpenter
Spire with 4 or 5 equal spiral cords
• Base with 5 spiral threads
Diam. Santa Barbara to Coronado Islands... optabilis Carpenter
• Base with 8 spiral threads
Diam. 4.5 mm. Bodega Bay to Coronado Islands ...acuticostata Carpenter
• Base with 12 spiral threads
Bering Sea to San Diego ....pupilla Dall
• Base with about 20 spiral threads
Diam. 11 mm. Alaska to San Diego .... rhodia Dall
Spire with 7 low spiral threads
Diam. 4 mm. Alaska to San Diego ....succincta Carpenter

Family Trochidae
Genus Norrisia Bayle,1880
Norrisia norrisii (Sowerby),1838 Monterey to Cerros Island
Genus Halistylus Dall,1889
Halistylus subpoideus (Tryon),1887 British Columbia to Panama
Genus Tegula Lesson,1832
T. (Chlorostoma) funebrale A. Adams,1854 Vancouver to Cerros Island
T. (Chlorostoma) gallina Forbes,1850 San Francisco to Gulf of Calif.
T.(Chlorostoma) montereyi Kiener,1850 Monterey to San Pedro
T. (Omphalius) ligulata Menke,1850 Monterey to Panama
T. (Omphalius)aureotincta Forbes,1850 Santa Barbara to Magdalena Bay
T. (Omphalius) mariana Dall,1919 Santa Barbara to Peru
T. (Chlorostoma) regina Stearns,1893 San Clemente to Gulf of Calif.
T. (Chlorostoma) rugosa A. Adams,1851 San Diego to Acapulco
T. (Omphalius) impressa Jonas San Diego to Tres Marias Islands
T. (Omphalius) reticulata (Wood),1828 San Diego to Peru
T. (Omphalius) globula Carpenter,1857 Gulf of Calif. to Panama
T. (Omphalius) pellisserpentis (Wood),1828 Gulf of Calif. to Panama
T. (Omphalius) rufoflammulata Koch Gulf of Calif. to Panama
T. (Omphalius) rufotincta Carpenter,1857 Gulf of Calif.
T. (Omphalius) panamensis (Philippi) Panama
Tegula coronulata (C.B. Sdams),1852 Panama
Tegula semirugosa (A. Adams),1851 Galapagos
Tegula cooksoni (E.A. Smith),1877 Galapagos
Tegula snodgrassi (Pilsbry & Vanatta),1902 Galapagos
Tegula quadricostatus Gray,1828 Peru and Chile
Tegula smithi (T. & G.),1874 Peru
Tegula patagonica (d'Orbigny),1840 Peru to Patagonia
Tegula eiseni Jordan Pleistocene, Magdalena Bay
T. (Chlorostoma) barkeri Bartsch and Rehder,1939 Galapagos
Tegula tridentata (P. & M.),1838 Peru and Chile
Tegula atra (Lesson),1830 Peru and Chile
Tegula moesta (Jonas),1844 Peru and Chile
Tegula euryomphalus (Jonas),1844 Peru and Chile
Tegula luctuosa (d'Orbigny),1841 Peru and Chile
Tegula fuscescens (Philippi),1844 Peru and Chile
Tegula gaudichaudi Hupe,1854 Chile
Tegula lugubris (Philippi),1844 Chile
Tegula melaleuca (Jonas),1844 Chile
Genus Monodonta Lamarck
Monodonta nigerrima (Gmelin),1791 Peru and Chile
Monodonta crusoeana Pilsbry,1889 Peru and Chile
Genus Calliostoma Swainson,1840
Calliostoma splendens Carpenter,1864 Monterey to San Diego
Calliostoma annulatum(Martyn)1784 Alaska to San Martin Island
Calliostoma costatum (Martyn),1784 Alaska to San Diego
Calliostoma canaliculatum (Martyn),1784 Alaska to San Diego
Calliostoma variegatum Carpenter,1865 Puget Sound to Cerros Island
Calliostoma platinum Dall,1889 Farallones to San Diego
Calliostoma antonii Koch,1843 Santa Barbara to Panama
Calliostoma gloriosum Dall,1871 San Francisco to San Diego
Calliostoma eximium Reeve,1842 Catalina to Gulf of Calif.
Calliostoma gemmulatum Carpenter,1864 San Pedro to Gulf of California
Calliostoma tricolor Gabb,1865 Santa Cruz to Cape San Lucas
Calliostoma supragranosum Carpenter,1864 Monterey to San Diego
Calliostoma turbinum Dall,1865 Pt. Conception to San Diego

(con.)

Calliostoma palmeri Dall,1871 Gulf of Calif.
Calliostoma leanus C.B. Adams,1852 Gulf of Calif. to Panama
Calliostoma macandrae Carpenter,1856 Gulf of Calif.
Calliostoma lima Philippi,1850 Gulf of Calif. to Panama
Calliostoma marshalli Lowe,1935 Gulf of Calif.
Calliostoma gemmuloides Lowe,1935 Gulf of Calif.
Calliostoma angelenum Lowe,1935 Gulf of Calif.
Calliostoma bonita B.H. & S.,1933 off Acapulco
Calliostoma rema B. H. & S.,1933 Tres Marias Islands to Acapulco
Calliostoma nepheloidea Dall,1913 West Mexico to Panama
Calliostoma iridium Dall,1895 Panama
Calliostoma fonkii Philippi,1860 Peruand Chile
Genus Turcicula Dall,1881
Turcicula bairdii Dall,1889 Bering Sea to Coronado Islands
Turcicula macdonaldi Dall,1889 Panama
Genus Turcica A. Adams,1854
Turcica caffea Gabb,1865 San Pedro to Cape San Lucas
Genus Cidarina Dall,1909
Cidarina cidaris A. Adams,1864 Alaska to San Quentin
Cidarina ceratophora Dall,1895 San Diego to Mazatlan
Cidarina equatorialis Dall,1908 San Diego to Ecuador
Genus Gibbula Risso,1826
Gibbula adriatica canfieldi Dall,1871 Monterey to San Diego
Genus Solariella Wood,1842
Solariella peramabilis Carpenter,1864 Forrester Island to Coronado Island
Solariella rhyssa Dall,1919 Catalina
Solariella triplostephanus Dall,1910 San Diego to Panama
Solariella nuda Dall,1896 Monterey to Gulf of Calif.
Solariella elegantula Dall,1925 La Paz
Solariella ceratophora Dall,1896 Gulf of Calif.
Solariella equatorialis Dall,1908 Panama to Ecuador
Solariella galapagana Dall,1908 Galapagos
Genus Velutonia
Velutonia galapagana Dall,1918 Galapagos
Genus Clanculus
Clanculus rubida Dall,1908 Panama and Galapagos
Genus Margarites Leach,1847
Margarites parcipicta Carpenter,1864 Alaska to San Diego
Margarites pupilla Gould,1849 Bering Sea to San Diego
Margarites rhodia Dall,1920 Alaska to San Diego
Margarites simbla Dall,1913 Santa Barbara Island
Margarites succincta Carpenter,1864 Alaska to San Diego
Margarites lacunata Carpenter,1864 Neah Bay to San Diego
Margarites lirulata Carpenter,1864 Alaska to San Diego
Margarites acuticostata Carpenter,1864 Bodega Bay to Guadalupe Island

The above list and keys are all from Mr. A.M. Strong's notebook.

Family Trochidae

Genus Norrisia Bayle,1880. Type (by monotypy), Trochiscus norrisii (Sowerby).

" Shell thick, conoidal, orbicular, covered by an epidermis, smooth; widely umbilicated, umbilicus surrounded by the callous extension of the columella; outer lip not thickened or sculptured" (Arnold).

Norrisia norrisii (Sowerby),1838. Monterey, Calif. to Cerros Island, L.C.

This species has been spelled with one i. The correct spelling is as above with two i- norrisii.

Dr. Joahua L. Baily Jr. makes an interesting comment on this species " Carpenter states that it has been reported that this species has a sinistral nucleus, and that if this should prove to be the case it should be removed from the Trochidae and placed in the Solariidae, which also has a sinistral nucleus."

Collecting data: Our experience has been to find this a comparatively common species and usually associated with the heavy marine algae. The best way to collect all you want is to get out into a kelp bed in a rowboat and simply pull them aboard. Common off Redondo Beach, San Pedro, Newport, and all points south as far as we worked on the coast of Lower Calif. We pick them up in the dredge but I think they were specimens simply knocked off of the kelp. (Burch)San Diego Bay at La Playa (Bristol); San Nicholas Island (Hemphill); San Pedro (Lowe); La Jolla (Bristol) (San Diego Museum).

Genus Halistylus Dall,1889. Type (by original designation and monotypy), H. columna Dall.

" Shell small, cylindrical, holostomate, polychromatic; operculum multispiral, coriaceous; dental formula 1/ X plus 4.4 plus X; type H. columna Dall. This group differs from Leiopyrga in its holostomate aperture and absence of spiral sculpture."

Halistylus pupoideus (Carpenter),1864. (H. subpupoideus (Tryon))

The consensus of opin on seems to be that Carpenter's name is valid and Tryon's name should be placed in the synonymy. This is following Grant and Gale and others.

Collecting data: This is a very common dredged shell. We have it from 10 to 40 fms. off Monterey; off Redondo Beach 10 to 25 fms.; It seems to prefer sandy bottom. Have sets from 14 fms. off Coronado Islands and from 8 fms. off Ballast Point, San Diego dredged by the late Dr. Fred Baker. Not uncommon in the Pleistocene of Hilltop Quarry, San Pedro, Calif. (Burch) La Jolla (Chaney); San Diego Bay (Dr. Baker); Kino Bay (Lowe); Scammon's Lagoon (Huey); San Pedro (Lowe) (San Diego Museum).

Dr. A. Myra Keen advises " I do not believe that pupoidea is to be regarded as a homonym of pupoides under the Rules. Hence, Carpenter's name will stand."

* Range- Forrester Island, Alaska to Panama. Type locality,Monterey.

Genus Tegula Lesson,1835 Type (by monotypy, fide Pilsbry,1889), Tegula elegans Lesson- Trochus pellis-serpentis Wood.

" Shell Trochoid or Turbinate, heavy, smaller than Trochus; columella twisted and usually terminating below in one or more obtuse projections or denticles; callosity spreading over umbilical region; umbilicus open or closed."

There are no species of Tegula s.s. in the California fauna.

Subgenus Chlorostoma Swainson,1840. Type (by subsequent designation, Herrmannsen,1846), Trochus argyrostomus Gmelin.

Grant a nd Gale, 1931, p.825 state of this subgenus " .. differs from Tegula s.s. in the more ventricose whorls, which rapidly increase in size until the penultimate whorl is reached, the body whorl showing a less rapid increase in diameter. This feature of growth gives the penultimate w horl an appearance of disproportionate size and produces a dome-like spire. The

(con.)

sculpture is variable, consisting of spiral ribs, or sometimes of numerous protractive riblets, irregular or granulose. The surface color is often dark purple or gray. Beneath the surface the shell is pearly. The aperture is very oblique, the outer lip being smooth and pearly within, the columellar lip bearing one or more obtuse denticles. The umbilicus is open or closed, a callus wash covering the umbilical region.

Chlorostoma differs from Calliostoma in its much heavier shell,dome shaped spire, less uniform spiral sculpture, teeth or small projections on the columellar or basal lip, and the dark or somble and unattractive outer shell layer. Calliostoma s.s. has an imperforate axis.

Section Chlorostoma s.s.

" With axial or spiral riblets or both, outer shell layer usually dark purple or black."

" Omphalius differs in its much reduced or entirely obsolete sculpture and its rather smooth, light-colored outer shell layer."

One reason for quoting Grant and Gale to such length is that many authors consider Chlorostoma of generic rather than subgeneric value. Woodring,1928 and many others follow this practice and it is possible that we may ultimately adopt this practice.

Tegula funebralis (A. Adams),1854. Vancouver Island, B.C. to Cerros Island, B.C. Type locality, California.

Collecting data: One of the most abundant species on the coast in our experience from Crescent City,Calif. to Todos Santos Bay, L.C. Not uncommon in some of the Pleistocene deposits such as Timm's Point, San Pedro. (Burch Cape Colnett, L.C. (Lowe); San Nicholas Island, L.C. (Lowe);Duxbury Reef (Lowe); San Diego (Orcutt); Pt. Loma (Bristol); Piedras Blancas Light (Cass) (San Diego Museum).

Tegula funebralis subaperta (Carpenter),1864. Neah Bay, Wash. to San Diego. " with an umbilical pit."

Collecting data: One would think that these umbilicate varieties had no significance and perhaps they do not, but the collector is compelled to note that certain colonies seem to have this characteristic and others do not. I am disposed to think it should be considered a valid variety.

Tegula gallina (Forbes),1850. San Francisco Bay to the Gulf of California. Type locality " probably from the Mazatlan coast" (Forbes).

Collecting data: Our experience with this species has been of interest only in that it increases in size as the range goes south. Specimens from below Todos Santos Bay on the outer coast of Lower Calif. are rougher and larger until those from Boca de Playa are giants for the species. Several years ago P.M. Connelly made a trip to San Quintin Bay, L.C. and brought back specimens of almost unbelievable size. (Burch); many localities from Catalina Island down to many Lower Californian localities; exceptionally large from Guadalupe Island, L.C. (Miss Bristol, San Diego Museum).

Tegula gallina multifilosa Stearns,1893. San Pedro, Calif. to Guadalupe Island, L.C. Type locality, Guadalupe Island.

Collecting data: This variety multifilosa would seem to have little significance other than that I can direct you to entire coves along the Palos Verdes Hills coast and elsewhere and wager that every single specimen

(con.)

you collect will be of this form. In fact it is the common form all the way from Malaga Cove to San Pedro (Burch); Todos Santos Bay and Guadalupe Island (Dr. F. Baker).

Tegula gallina tincta (Hemphill),1893. Halfmoon Bay, Calif. to Socorro Island. Type locality not given.

Collecting data: Again this odd form seems to be found in colonies. The first I everr ran across was near La Jolla and it was possible to collect any number of them all showing the characters described including the yellow spot. What significance this has or what caused it I do not know. (Burch); Todos Santos Bay (Huey); San Diego (Hemphill); Bird Rock (Kelsey) La Jolla (Bristol); San Pedro and Cape Colnett (Lowe) (San Diego Museum).

Tegula gallina umbilicata Dall,1919. Santa Monica Bay (Burch) to San Quintin Bay, L.C. Type locality, San Quintin Bay.

Collecting data: Again this umbilicate form seems to congregate in colonies. There is a small cove just south of Redondo Beach where in my experience every single specimen is umbilicate. In the next cove you will not find a one.

However, there seems to be some kind of overlapping here because this colony of umbilicate specimens to which I referred above are also very definitely multifilosa giving you your choice of whether you wish to call it umbilicata or multifilosa. Perhaps these varieties had allas well be placed in the synonymy since the varieties certainly overlap.

Tegula brunnea (Philippi),1848. Crescent City, Calif. to the Santa Barbara Islands (Dall). Type locality, Calif.

Collecting data: Our experience has been to find this a central California species. It is very abundant from Monterey to Cayucos. It seems to like a little more water than funebralis being found nearer the low tide mark. (Burch); Cayucos and Duxbury Reef (Lowe); Piedras Blancas Light.(Cass); Half Moon Bay (Button); Bolinas (Hemphill); Point Sur (Gifford) (San Diego Museum.)

Tegula brunnea fluctuosa Dall,1919. Crescent City to San Nicholas Island, Calif. Type locality, Monterey, Calif.

Dr. A. Myra Keen writes an interesting comment here " Note that Dall described a Tegula brunnea fluctuata in Amer. Jour. Conch., vol.7, 1872, p. 130. Type locality, Monterey." I do not have this reference. Is this perhaps the same thing ?

Collecting data: This ribbed form in our experience may be expected to appear in the ratio of about 1 in 100 in all colonies. They are easily recognized and may have some significance. I think it doubtful. I thought that we found a larger percentage than usual of this form at San Simeon,Cal.

Tegula rugosa (A. Adams),1851. San Diego, Calif. to Acapulco,Mex. Type locality not given.

This is another of those very doubtful records. Did anyone ever hear of a specimen from San Diego ? We have it from many localities from Lower California and it is possible that a specimen might stray into San Diego but certainly it would be a stray IF not just an erroneous record. It is not of our fauna and should in my opinion be dropped from the list. It is of the Mexican fauna.

Tegula montereyi (Kiener),1850. Bolinas Bay to the Santa Barbara Islands California. Type locality, Monterey, Calif.

Dr. A. Myra Keen advises " Winckworth shows (Proc. Mal. Soc. vol. 21, p. 234) that *Tegula montereyi* was published by Kiener in 1850)"

Collecting data: All of our specimens of this species came from Monterey Bay from the kelp. (Burch); Duxbury Reef (Lowe); Cayucos (Lowe); Monterey (Oldroyd) (San Diego Museum).

Tegula regina (Stearns),1892. Catalina and San Clemente Islands south to Gulf of California. Type locality, on advice of Dr. A.M. Keen is " Guadalupe Island, holotype label, U.S.N.M."

Dr. Keen also advises " *Tegula regina* was first described by Stearns in 1892, Nautilus, vol. 6, p. 85"

Collecting data: This exceedingly rare shell has recently been taken in some numbers by Mr. H. Jacobs, by diving off Catalina Island. It is a beautiful and unique shell and found in very few collections.

Subgenus *Promartynia* Dall,1909. U.S. Geol. Surv. Prof. Paper 59, p. 94,1909. Type (by original designation), *T. pulligo* (Martyn).

This group is easily distinguished from the above by noting the umbilical area.

Tegula pulligo (Gmelin),1790. Sitka, Alaska to Natividad, L.C. (Cooke).

Dr. A. M. Keen advises on this species " Dall states (Proc. U.S.N.M. vol. 29, p. 423) that the King George's Sound of Martyn is actually Nootka Sound, sputhwest coast of Vanvouver Island. Martyn said " New Zealand", but probably Dr. Dall was right. *Tegula pulligo* may date from Gmelin,1790. Mrs. Oldroyd's *taylori* seems rather to be a topotype of *pulligo* than a subspecies."

Collecting data: There seems to be some variation in the shells we have so labelled from the north and those from Monterey and the south but they must all be the same species or something not described. We have fine specimens from Monterey Bay from the kelp; also from Cayucos; Morro Rock; Oceano,San Luis Obispo Co.; and we were very much surprised to bring up specimens apparently of this species from nearly 50 fathoms off Redondo Beach (Burch); Forrester Island, Alaska (Willett); Farallones Islands (Lowe); Monterey and Long Beach, Calif. (Lowe); Point of Rocks (Bristol); Point Loma (Chaney) (San Diego Museum).

Tegula pulligo taylori I. Oldroyd,1922. Marine shells of Puget Sound and Vicinity, Puget Sound Biological Station 4:171. Type locality, Hope Island at the north end of Vancouver Island and known only from the type locality. The consensus of opinion seems to be that this variety is of no signoficance and should be placed in the synonymy of the typical.

Mr. W.J. Eyerdam reports having taken typical *pulligo* from Clallam Bay, Stair of Fuca, Wash,1925; Craig, Prince of Wales Island, Alaska,1939 by Norberg.

Subgenus *Omphalius* Philippi,1847. Type (by subsequent designation, Herrmannsen,1847), *Trochus rusticus* Gmelin. Japan.

" Shell medium sized, body whorl subangular or rounded at the periphery umbilicate. Aperture oblique, elliptical. Inner lip bearing a heavy tooth at the base, below which lies a more obscure tooth-like swelling. Callus spreading from parietal wall toward and partly over umbilicus. Sculpture consisting of spiral threads or of crude protractive axial ribs." (Woodring,1928).

Tegula aureotincta (Forbes),1852. Santa Barbara Islands south to Santa Margarita Island (Stearns). Type locality: " Probably from the Mazatlan coast

Collecting data: Malaga Cove; San Pedro; Point Vicente; San Onofre; Punta Banda, L.C.; etc. This is not an uncommon medium tidal zone species. (Burch); San Diego (Hemphill); Pt. Loma (Kelsey); Todos Santos Bay (Dr. F. Baker); Magdalena Bay (Orcutt); Guaymas (Herrera); San Diego Mus.

Tegula impressa (Jonas),1848. San Diego, Calif. to Tres Marías Islands. Mazatland and Manzanillo (Lowe) (no California records) ?

Tegula ligulata (Menke),1850. Monterey, Calif. Moss Beach, Calif. (Voorhees to Acapulco, Mexico. Type locality, Mazatlan.

Dr. A. Myra Keen advises on this species as well as the following (Per. Comm. Nov. 1945) " I do not have the papers by Menke, Jonas, or Wood at hand to consult. However, at the National Museum I made the following notes based on specimens in that collection." Tegula ligulata ranges south to Real Llejos. There seems to be no true T. reticulata from north of Costa Rica; those so labelled are ligulata. The T. mariana from Santa Barbara looks to me like ligulata. the northernmost mariana in this collection is from Cape San Lucas."

We are therefore dropping the following species from our faunal list:

Tegula reticulata (Wood),1828. Range- south to Guayaquil. Type locality Gulf of Calif.

Tegula mariana (Dall),1919. Range- south to Peru. Type locality, La Paz. Reference- Pilsbry and Lowe, Proc. Acad. Nat. Sci. Phila. vol. 84:85

Collecting data for T. ligulata: Our experience has been to find this perhaps the most numerous species of the genus from Santa Monica Bay south to Todos Santos Bay in all rocky rubble. It is common on the off shore islands also. (Burch);

We will discuss the other genera of the family Trochidae in the next issue.

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The interesting little Bulletins of the Natural History Museum of San Diego are at hand for the months of November and December. They are expecting to have the Navy relinquish their building which has been being used as a hospital, and in the near future resume all of their normal activities. They seem to be enjoying a steady flow of new aquisitions from their members now scattered all over the earth. The mention of again receiving scientific journals from Europe was of interest also.

Mollusca, Vol. 1, no.7, Dec. 17,1945 published by Paul H. Reed, Tavares, Florida- rate $2.50 for 12 issues. Mr. Reed has brought out a very fine edition this time and should be congratulated.

Strombus jeffersonia Van Hyning is a new species well described and well figured in this issue.

Mr. Harold Harry, Rt. 2, Box 222, Shreveport, Louisiana. The following interesting note received with the very unusual Chinese Christmas card " Greetings from Tsingtao,China, to the Burches and all my friends of the Conchological Club of So. Calif. Expect to be in Seattle by late December and for a month following; after which may greet you of Los Angeles in person. After mid February please use home address. Have been getting the Minutes very rarely because of poor mail service, but am very grateful that you rem-

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-embered me with them. When I'm home for good I'll have duplicates for everyone interested from such places as Eniwetok,Saipan,Ulittu,Ise Shima, Bouganville,New Caledonia,China,Lelelieu,Manus; will begin to pay off my socio-conchological debts then.

W.J. Eyerdam, 7531 19th Ave., N.E., Seattle 5, Wash. " Mr. H. Harry is in Seattle on a warship at present and has been over to see me. He brought about 70 species of shells that he collected at Tsingtao, Ise Jima and the Palau Islands. I identified all except three or four of them for him. Dr. Myra Keen has just submitted the names of the critical species of shells that I sent her from this summers vacation. Five of them are new to my collection of Alaskan shells. On Raspberry Island I collected 104 species of shells this year. I will submit the list pretty soon."

J.M. Grech, 57/59 Behind St.,; Ubaldesca, Paula, Malta. In years past the editor has exchanged extensively with Mr. Grech and many fine shells now in the cabinets bear his labels. Mr. Grech writes that a large part of his shell collection was destroyed in the bombings of Malta and that he is now eager to replace themand to exchange again extensively. Inasmuch as it is out of the question for the editor to handle such exchanges at this time the matter is called to the attention of other members who may be interested.

E.C. Jaeger, U.S. Engineer Dredge Sacramento, A.P.O. 180, c/o Postmaster San Francisco, Calif.

" I saw your September issue of the Minutes of the C.C. of S. Calif. and on the front page w as a letter written to you by my Captain, S.L. Kimball. Captain Kimball has interested me,and s hown me a lot of the tricks of shell collecting, and we have had many a fine hour together here on the reefs and shores of Okinawa. I have only been collecting four months now and have well over two hundred different species of shells from Ohinawa. I know nothing about shells at all and have to get all of my information from Captain Kimball, who is always willing to assist me within his power. I have collected a fine lot of shells for myself,and in the course of this collecting, have accumulated many duplicates. These I would like to sell, if it is possible. Captain Kimball suggested I write to you to see if you would help me out. All but very few of my shells were taken alive. Our system is to keep a dead shell until we find a live one and then discard the dead one. I have among my shells 25 different species of Conus, with 15 more probables. 18 different Cypraea with five probables, 3 species of Haliotis, Turbo,Conchs, 3 different Murex,Patella,Nerita polita and undata, Cerithium nodulosum, several Trochus Engina mendicaria,Bulla, several Vasum, a number of Mitra, several Pterocera, and numerous other shells that we do not know the names of. All our knowledge of these shells is gathered from the Handbook for Shell Collectors by Walter Webb. If you can notify me by return air mail,as to whether I could dispose of these shells, I would appreciate it very much. I am mailing out a small lot of them to you personally, for use by the club, rather than subscribe to the Minutes which are available to me through Captain Kimball. I sincerely hope to hear from you by return air mail as that is the quickestway."

Surely some of the club members will be interested in this deal.

Dr. Asela B. Franco, Cebu City, Cebu, Philippines. It was a great pleasure to receive a long letter from Dr. Franco from whom we have in the past received many beautiful and rare shells. " ...... It was the Americal Division who liberated my own place from the Japs. And the 77th Division came over for a rest after their bloody campaign in Okinawa. These men and the Navy filled Cebu with Americans for the time being. Later, most of them went over for the occupation of Japan. (con.)

It was a miracle that my parents and myself came out alive in this war. The Japs are the most inhuman beings I have ever met with- they are just simply beasts. I have seen moving pictures before the war depicting the cruelties of the Germans and many of us here used to say that they were only propaganda/ But now we know better from the Japs who were much worse. They have done atrocities created only from a devil's mind. My place, Cebu received the heaviest damage in comparison with the rest of the Philippines. Most of the houses were burned either by bombing or by demolition. Personally, we lost eight houses including that of my downtown clinic. Our residence was spared us with two other houses. I have been visited by many American shell collectors. Some of them are just beginners, others rather advanced, but most of them just shell souvenir hunters. To all of them I have given many of my available duplicates as my compliments for the sacrifices they made in this war. The bulk of my good duplicates were in my clinic. I had one big room for display and another room for deposits. You see, I occupied the whole building for my clinic and I converted two rooms for my shell hobby. The rest of the building was for my medical practice. All of this was burned including the bulk of my stamp duplicates. The minute I am free with my patients I go through my hobbies. Also I had a small warehouse where I deposited several thousands of Nautilus pompilius for American dealers and about fifty thousand Ovula ovum L. ready for export to New Guinea. Other bigger shells and the less delicate ones were kept in this place. This too was burned. My own personal collection I always keep in my own sleeping room. These I do not trust out of my sight or any other place. I was able to evacuate them to the mountains about sixty miles from the city. My best duplicates, which were at home, were mostly intact when we returned from evacuation. And these were the ones I gave to the Americans who came over to see me. During the Jap occupation nobody did any shell collecting. The souvenir hunters spoiled everything in prices- 50¢ to $1.00 for a simple Cypraea tigris and $30.00 or $15.-- for a Nautilus with a design of a map of the Philippines. I am expecting the prices to drop down when most of the Americans leave the islands. "

Rev. William Henry Fluck, Newfane, Vermont. " I thank you for sending me the Minutes of the Conchological Club of Southern California. I think it exceedingly helpful especially to one like myself isolated from other conhhologists. It is a great help to me in keeping the nomenclature of my California shells up to date.

In the October number, there was some question made as to the proper spelling of Ianthina. It is a well known fact that the letter J was but slightly distinguished by the ancients from the letter I. In English, I and J were originally calligraphic variations of the same letter, and stood for both the vowel and the consonant sound, but gradually, after about 1630, J came to be used for the consonant sound of dz or J as we now use. it. In one of my dictionaries I read that " I and J were treated as the same letter in alphabetical arrangements as late as Todd's Johnson's Dictionary of 1818."

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The following persons are perhaps interested in purchasing :

Leona Lagdowski, Burr Hall, Willimantic, Conn.
Walter Anderton, 19 Glen Ivis Park, B'ham, Alabama
Caroline Cobb, 18 Chestnut St., Boston, Mass.

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
March 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965.

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The program we have been carrying on in our Minutes should serve as a supplement to the four volumes by Ida Shepard Oldroyd " The Marine Shells of the West Coast of North America", a Stanford University publication selling for $10.00 bound in cloth. We will be pleased to handle the orders of any of our members or friends wishing this set. It has been our intention to republish the original descriptions of all species described or added to our fauna since the publication of Mrs. Oldroyd's work in 1927.

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Genus Calliostoma Swainson,1840. Type (by subsequent designation, Herrmannsen,1846), Trochus conulus Linnaeus (- " Calliostoma conula Mart.")
" Imperforate; spire elevated, acute; aperture broader than high,transversely ovate, hardly sinuated at the base,and slightly oblique; shells always smooth, and often polished." (Swainson).

Subgenus Zizyphinus Gray,1843. Type (by subsequent designation,Rehder,1937), Calliostoma canaliculatum (Martyn) - C. dolarius (Holten),1803.
Dr. A. Myra Keen advises us on this matter as follows (Per. Comm. Nov. 1945) " In a paper entitled " Notes on the nomenclature of the Trochidae", (Proc. Biol. Soc. Wash., vol. 50, pp. 115-116, 1937), Rehder shows that the name Zizyphinus Gray dates from 1843 (Gray in Dieffenbach, Travels in New Zealand, vol.2, p. 237). Rehder designates as type the West American species canaliculatus Martyn and comments that he does not know whether or not Zizyphinus is generically distinct from Calliostoma. Perhaps, since he has made a West American species the type, we might recognize Zizyphinus as a subgenus of Calliostoma for the time being. The first available specific name for canaliculatus is Trochus doliarius Holten,1803 (see Proc. Malac. Soc. London, vol.25, pt.4, p. 149)."

Calliostoma doliarius (Holten),1803. (Calliostoma canaliculatum (Martyn).
Izhut Bay, Afognak Island, Alaska (Eyerdam) south to San Diego, Calif.
Several color forms of this species have been described. If any of the members think they have any significance please advise. I propose to abandon them to the synonymy. At one time I thought nebulosum might be good but it

(con.)

runs right into the typical off San Diego, its type locality. I have a large series of them.

C. c. nebulosum Dall,1919- Type locality, San Diego (parvum Williamson)

C. c. transliratum Dall,1919- Type locality, Biorka Island,Sitka,Alaska.

Collecting data: We have collected this species from Crescent City, Calif. ; Monterey Bay dredged and picked from floating kelp; dredged off Redondo Beach, Calif. in 25 fms.; off Coronado,San Diego, Calif. on floating kelp; Imperial Beach, San Diego Co. on kelp (Burch); Puget Sound and the record given above extending the known range northward from Sitka to Afognak Island, Alaska (Eyerdam);

Calliostoma ligatus (Gould),1849. (C. costatum (Martyn),1784). Prince William Sound and westward to Kodiak Island (Eyerdam) south to San Diego, Calif. Dr. A. Myra Keen advises on this as follows (Per. Comm. Nov. 1945) " The type locality of C. costatum Martyn is " King George's Sound, New Zealand". However, the first available name for the species seems to be Trochus ligatus Gould,1849 (Proc. Boston Soc. Nat. Hist., vol.3, p. 91), type locality Puget Sound. Original description: " Testa solida, ovato-conica imperforata, costulis rotundatis flavescentibus ubique cincta, intervallis incarnatis concinne clathratis, ad apicem violacea: spira anfr. 6 convexis: apertura circularis; columella recta rotundata; labro crenulato: regio umbilicalis vix indentata. Alt. 3/4, lat. 2/3 poll." This was figured in the U.S. Exploring Expedition, Atlas,1852, pl. 12, fig.207 (reproduced by Tryon and Pilsbry, Manual Conchology, vol. 11, pl.16, fig.6). The name filosus Wood is not available, as I had previously thought, being homonymous."

Collecting data: Our experience has been to find this by far the most common littoral species of the genus. We have collected it from Crescent City, Calif. south to San Luis Obispo Co. but have never taken it in southern California. We dredged it in numbers on the shale off Monterey down to perhaps 20 fms. (Burch); " I have found this species all along the coast up to the Kodiak Islands. The largest specimens I have are from Izhut Bay and Raspberry Strait, Afognak Island. Extended geographical range- northward to Prince William Sound and westward to Kodiak Island" (W.J. Eyerdam); Sitka,Alaska and San Juan Island, Puget Sound (Lowe); Bear Bay, Peril Straits (Kate Stephens); * Note* there is a record in the San Diego museum from Acapulco, Mexico by Orcutt. This sounds so improbable that obviously such a radical southern extension of range should be carefully verified before publication ."

The variety caeruleum Dall,1919 is in the opinion of the majority a mere color form and to be found in all colonies, of no significance and to be abandoned to the synonymy along with another color form pictum Dall,1919 . However, Mr. W.J. Eyerdam reports that in his opinion caeruleum is a distinct color variety at least in Puget Sound and reports it from San Juan Islands. Lowe also has a set from Port Harford in the San Diego Museum so labelled.

Calliostoma variegatum Carpenter,1864. Forrester Island, Alaska (Willett) south to Cerros Island, L.C. Type locality, Puget Sound, Wash.

Collecting data: Dredged off Svalon, Catalina Island in 35 fms.; off Monterey in 20 fms. (Burch); dredged in Puget Sound near San Juan Island (T. Kincaid); San Juan Islands, Wash. (W.J. Eyerdam); Catalina Island, Calif. in 50 fms. and San Juan Islands, P.S. in 80 fms. (Lowe) (San Diego

Calliostoma platinum Dall,1889. Farralone Islands, Calif. to San Diego Type locality, Santa Barbara Islands in 414 fms.

(con.)

Collecting data: San Diego in 50 fms. (Grimpp); Monterey in 122 fms. (Oldroyd) (San Diego Museum); Mr. John Strobeen acquired some of these brought up on fishermen's lines off Santa Cruz, Calif.

Calliostoma gloriosum Dall,1871. South of San Francisco to San Diego. Type locality, Soquel, north side of Monterey Bay.

Collecting data: Dredged off Monterey in 20 fms.; exceptionally huge and fine specimens dredged off Redondo Beach, Calif. in 25 fms. gravel(Burch); washed in on kelp at Imperial Beach, San Diego Co. (Mrs. J.A. Randall); Santa Cruz, Calif. littoral (Mrs. H.R. Turver); Coronado Beach (Galloway); Mission Beach in kelp roots (Chaney); La Jolla and San Pedro (Lowe); Monterey (Oldroyd) (San Diego Museum).

Calliostoma antonii (Koch in Philippi),1843 Santa Barbara, Calif. to Panama. This is another representative of the southern fauna with a doubtful California record. Th re are s ets in the San Diego Museum in the Lowe Collec ction from Montijo Bay, Panama and Panama City, but none from north of Panama. Type locality was not given for the species.

Calliostoma eximium Reeve,1843 Catalina Island to Mazatlan, Mexico. Type locality, Payanam in 10 fms. Another species from the southern fauna and all records in local museums from south of the border.

Calliostoma tricolor Gabb,1865. Moss Beach (Vokes) south to Cape San Lucas. Type locality, San Pedro, Calif. probably although Half Moon Bay and San Diego also mentioned.

Collecting data: Dredged off Monterey in 20 fms. to 40 fms.; common off Redondo Beach, Santa Monica, etc. in 25-35 fms.; off Catalina Island in 35 fms. (Burch); San Diego Bay in 8 fms. (Hemphill); San Diego and Long Beach (Lowe) (San Diego Museum).

Calliostoma gemmulatum Carpenter,1864. / Cayucos,Calif. (Burch) San Pedro, Calif. to the Gulf of California. Type locality, San Diego- San Pedro area.

Collecting data: Our experience has been to find this species more or less common in littoral collecting although we have picked it up in dredgings as deep as 25 fms. off Redondo Beach. We have taken it littoral at Cayucos; bridgeand wharf piles in Anaheim Bay; Balboa breakwater; Malaga Cove; and Ensenada,Mexico (Burch).

Calliostoma supragranosum Carpenter,1864. Monterey south to Pequena Bay, L.C. (E.K. Jordan). Type locality on advice of Dr. A.M. Keen " San Diego according to the holotype label".

Collecting data: Malaga Cove, L.A. Co., littoral; San Pedro brwakwater (Burch); Imperial Beach, San Diego Co. washed in on kelp (Mrs. J.A. Randall) San Pedro (Oldroydand Baker); San Pedro breakwater (Lowe) (San Diego Mus. .)

Calliostoma splendens Carpenter,1864. Monterey south to Guadalupe Island (Strong and Hanna). Type locality on advice of Dr. A.M. Keen " Catalina Island according to the holotype label, U.S.N.M."

Collecting data: Dredged off Monterey, Calif. in 20-40 fms.; off Redondo Beach common in gravel 25 fms.; off Avalon, Catalina Island in 35 fms.; off Ensenada in Todos Santos Bay in 35 fms. (Burch); Mission Bay (Chaney); Catalina Island in 50 fms. (Lowe); San Pedro in 30 fms. (Lowe) (San Diego Museum.)

Calliostoma turbinum Dall,1895. Point Conception to San Diego and the Islands. Type locality, among the Santa Barbara Islands.

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms. and also in 50 fms. (Burch); San Diego in 35 fms. (Gripp).

Calliostoma annulatum (Humphrey),1786. Dr. A. Myra Keen advises on this name as follows (Per. Comm. Nov. 1945) " According to Winckworth's Notes (Proc. Malac. Soc. London, vol. 25, pt. 4, p. 150,1943), we may cite Calliostoma annulatum as of Humphrey,1786. Presumably Humphrey cites Martyn's figures, so that the type locality would remain the same " New Zealand".

Range: Forrester Island,Alaska south to San Diego, Calif.

Collecting data: Dredged off Monterey in 15-20 fms.; off Morro Bay and Cayucos; off Redondo Beach, Calif. in 25 fms. mud and gravel; (Burch); Rocky Bay, San Juan Islands, Wash. Sh.and Mud in 45 fms. (Miss R.E. Coats); fine colored specimens washed in on kelp at Imperial Beach, San Diego Co. (Mrs. J.A. Randall); Orcas Island, Wash. in 10 to 30 fms. (Dr. Baker); Monterey on kelp (Hemphill); Forrester Island (Willett); Coronado Beach, San Diego Co. (Jerabeckand Todd) (San Diego Museum).

Genus Turcicula Dall,1881. Type (by monotypy), Margarita (Turcicula) imperialis Dall.

" Shell globosely conical, white, thin; umbilicus reduced to a chink under the thin callus of the upper part of the pillar lip; mouth rounded rectangular, margins all thin; columella concave; outer surface with tuberculose ridges." (Tryon and Pilsbry, Man. of Conch.)

Turcicula bairdii Dall,1889. Bering Sea south to Coronado Island. Type locality, off San Clemente Island in 414 fms.

Collecting data: Drier Bay, Knight Island, Prince William Sound, Alaska - dredged (Eyerdam); Off Point Loma, San Diego Co. in 200 fms. (Lowe)

Genus Turcica A. Adams,1854. Type (by monotypy), Turcica monilifera A. Adams.

Shell conoidal, thin, subdiaphanous, imperforate; whorls with transverse series of granules, the last rounded at the periphery; columella solid, spirally twisted at the upper part, ending below or anteriorly in an obtuse prominent point; outer lip thin, simple, acute." (Adams).

Turcica caffea (Gabb),1865/ Monterey to Cape San Lucas. Type locality, Monterey in 20 fms..

Grant and Gale state " This shell looks something like a Calliostoma but has two twisted fold-like protuberances on the columella and a conspicuously channeled or depressed suture.

Collecting data: Dredged off Monterey in 20 fms.; common off Redondo Beach in gravel at 15 to 25 fms.; not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch); from kelp washed in after storm at Imperial Beach, San Diego Co. (Mrs. J.A. Randall); San Pedro brwakwater (E.P. Chace); Coronado in kelp roots (Bristol); La Jolla and San Pedro (Lowe) San DiegoM.

Genus Cidarina Dall,1909. Type (by original designation), Margarita cidaris A. Adams.

" Shell large, whitish, unicolor, with strong spiral sculpture, sharply nodose, the umbilicus closed by a reflexed layer of callus, the suture channeled." (Dall,1909).

(con.)

Grant and Gale comment on this genus as follows, p 838" This genus was originally differentiated as a section of Margaritos Leach, in Gray, 1847. It is distinguished from Solariella by its closed umbilicus."

Cidarina cidaris (Carpenter),1864. Izhut Bay, Afognak Island, Alaska,1922 dredged (Eyerdam) south to Cape San Quentin, L.C. Type locality, Neah Bay, Wash.

Collecting data: Dredged off Redondo Beach in 50 fms.; off Bluff Cove in 50 fms.; also in 75 fms; Pleistocene of Timm's Point, San Pedro (Burch); Mr. Eyerdam's record stated above is a northward extension of range from Kasaan Bay; Forrester Island, Alaska in 40 fms. (Willett); Puget Sound (Randolph-dredged); N. of Gabriola Id., B.C. (Oldroyd); Redondo Beach in deep water (Lowe).

Subgenus Calliotropis Seguenza,1903. Type (by original designation) Trochus ottoi Philippi.

Dr. A. Myra Keena dvises on this group as follows (Per. Comm. Nov. 1945 " There is no Solaricida Dall,1902. It should be Calliotropis Seguenza, 1903 (Bol. Soc. Geol. Ital., vol. 21, p. 462). Type (orig. des.), Trochus ottoi Philippi. Description (freely translated): " Form related to Ampullotrochus Monterosato, differing by having whorls with two conspicuously projecting carinae above the suture,otherwise smoothly and evenly convex."

Cidarina carlotta Dall,1902. Queen Charlotte Islands, B.C. in 1588 fms. ooze.

Cidarina ceratophora Dall,1895. San Diego, Calif. to Mazatlan, Mexico in deep water. Type locality, La Paz, Gulf of Calif. in 1,421 fms.

Cidarina equatorialis Dall,1908. San Diego, Calif. to Ecuador in deep water. Type locality, off the Ecuador coast in 1,132 fathoms.

Genus Solariella Wood,1842 Type (by monotypy), S. maculata S. Wood.

" Shell small, spire low, inner layer nacreous, umbilicus very wide and deep. Aperture subcircular,almost parallel to the vertical axis of the shell, peristome attached to parietal wall along oonly small part of its circumference. Outer lip, as viewed from above, slightly convex forward between suture and periphery of body whorl. Basal lip virtually straight. Sculpture consuisting of spiral threads modified by fine axial threads. (Woodring).

Solariella peramabilis Carpenter,1864. Forrester Island, Alaska to San Diego and the Coronado Islands. Also Japan. (Dall). Type locality, Catalina Island in 30 to 120 fathoms.

Collecting data: Dredged off Redondo Beach in 50 and 75 fms.; off Avalon Catalina Island in 35 fms.; not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch); Forrester Island, Alaska in 20-50 fms. (G. Willett); dredged in Puget Sound near the San Juan Islands (T. Kincaid); San Juan Island (Eyerdam); Catalina Island in 35 fms. (Lowe).

Solariella triplostephanus Dall,1910. Off San Diego, Calif. and south to Panama in deep water. Type locality, off La Paz, L.C. in 12 fms. sand.

Coll. Data: Magdalena Bay in 10 fms. (Lowe); Manzanillo in 20 fms. and San Benito Island in 10 fms. (Lowe) (San Diego Museum).

Solariella rhyssa Dall,1919. Catalina Channel, Calif.

Solariella nuda Dall,1895. Monterey, Calif. to Clarion Island. Type locality, off Lower Calif. in 298 to 455 fathoms.
Collecting data: San Diego in 50 fms. (Gripp) (San Diego Museum).

Subgenus Macheroplax Friele,1877 Archiv. f. Math. og Naturvedensk for 1876, p. 311) Type (by subsequent designation, Pilsbry,1889), M. affinis (Jeffreys) = Margarita amabilis Jeffreys.

Solariella varicosa (Mighels and Adams),1841. Arctic Ocean to San Diego. Also Atlantic. Type locality, Bay Chaleur in stomach of a codfish.
Collecting data: Hinchinbrook Island, Pr. Wm. Sound, Alaska (dredged (Norberg); Illiuliuk Bay, Unalaska Island, Aleutians,1932; Izhut Bay, Afognak Island, Alaska,1922; Vadso,Norway, ex Tromso Museum (W.J. Eyerdam);

Solariella obscura (Couthouy),1838. Arctic Ocean to Straits of Juan de Fuca. Circumboreal. Type locality, Massachusetts Bay.
Collecting data: Illiuliuk Bay, Unalaska Island, Aleutians,1932(Eyerdam)
Mr. Eyerdam sent in a record for a subspecies with which we are not familiar. Any additional data will be appreciated. It is S. obscura bella Verkruzen and reported from Unalaska Island,Aleutian Islands in 1932.

Solariella paupercula (Dall), 1919. Arctic Ocean to the Aleutians. Type locality, Arctic Ocean north of Bering Straits.

Genus Margarites Leach in Gray,1847. Type (by monotypy), Helix margarita Montagu= Trochus helicinus Frbricius,1780
" Shell umbilicate, orbicular, conoidal or depressed, thin; not variegated; whorls rounded, smooth or spirally lirate; aperture subcircular, peristomesimple, acute, the margins approaching; columella arcuate, simple, thin." (Pilsbry).

Subgenus Pupillaria Dall,1909. Type (by original designation), Trochus pupillus Gould.
" Shell dull, trochiform, unicolor, strongly spirally striated, sometimes radiately ribbed, and with more numerous whorls. Chiefly temperate seas."(Dall)
Grant and Gale comment " There is less difference between Pupillaria and Lirularia than between either of the two and Margarites s.s. " " Lirularia is smaller than Pupillaria."

Margarites pupillus Gould,1849. Nunivak Island, Bering Sea to San Pedro, Calif.; to San Diego in deep water. Type locality, New Zealand but no doubt this is an error.
Collecting data: Dredged off Redondo Beach in 50 fms.; littoral from Crescent City; De Poe Bay, Oregon; a common littoral shell in the northern part of the range, but taken only by dredging in southern California. Not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch)/; Puget Sound, Drier Bay,Knight Island, Alaska; Izhut Bay, Afognak Island (Eyerdam);

Margarites sordidus Hancock,1846. Arctic Coast, Bering Strait and the Okhotsk Sea. ? North Japan. Circumboreal.

Margarites cinereus (Couthouy),1838. Bering Strait to Port Etches,Alaska. Circumboreal. Type locality Massachusetts Bay.
Collecting data: Drier Bay, Knight Island, Alaska,1923 (;(Eyerdam); also 62 39 ' N 177 W in 55 fms. clay- Vega Expd. 5/8/1879 (Eyerdam); Frenchman's Bay, Maine (San Diego Museum)

Margarites vorticiferus Dall,1873. Bering Strait and Sea, south and east to Unalaska, Alaska. Type locality, Iliuliuk Harbor, Captain's Bay, Unalaska, Alaska. Collected fromtype locality by W.J. Eyerdam.

Margarites vorticiferus sharpii Pilsbry,1898. Unalaska to Port Althorp, Alaska. Type locality, Dutch Harbor, Unalaska.
Collecting data: Collected from the type locality by W.J. Eyerdam.

Margarites vorticiferus escarinatus Dall,1919. Southwest of Point Barrow, Arctic Ocean and south and east to the Aleutians.
Type locality: Sta. 22, N. Lat. 69 35' and W. Long. 163 27', in 11-12 fms.

/ to San Pedro,(Lowe)
Margarites salmoneus Carpenter,1864. Puget Sound to Cayucos, Calif. San Luis Obispo Co., Calif. (Burch). Type locality, Monterey and Santa Barbara Islands, Calif.
Collecting data: Dredged off Monterey in 15 fms.; Cayucos, Calif. littoral (Burch); near Arroya Grande, Calif. (Tremper); San Pedro (Lowe) (San Diego Museum).

Margarites rhodia Dall,1921. Port Althorp ,Alaska to San Diego, Calif. Type locality, Puget Sound, Vancouver Island and Neah Bay.
Collecting data: Crescent City, Calif. (E.P. Chace).

Margarites rudis Dall,1919. Bering Sea to Cook's Inlet, Alaska; also Kamchatka. Type locality, Coal Harbor, Shumagins,Alaska in 8 fms.

Margarites healyi Dall,1919. Arctic Ocean north of Bering Strait. Type locality, north of Bering Strait, Sta. 10 of U.S.S. " Corwin".

Margarites simbla Dall,1913. Off Santa Barbara Islands, Calif. Type locality, deep water off Santa Barbara Channel, Calif.

Subgenus Lirularis Dall,1909. Type (by original designation), Margarita lirulata Carpenter.
" Shell small, dull-surfaced, with variable color patterns, strong spiral sculpture,and delicate axial sculpture. Tropical and warm temperate seas." (Dall)

In our Minutes #16, p. 3, October,1942, Mr. George Willett discussed this group. Exceppts from Mr. Willett's paper follow:
" In the process of naming the Margarites of the subgenus Lirularia, which are so abundant in the Lower Pleistocene deposits of San Pedro, I found it necessary to study the characters of all the Pacific coast representatives in our collections. As this group has puzzled many west coast conchologists (myself included), it may be worth while to report the conclusions arrived at in this study for what they are worth.

It appears to me that there are only three rather variable species of Lirularia commonly represented in west American collections, these being Margarites succintus Carpenter,M. lirulatus Carpenter, and M. optabilis Carp/

(con.)

These three, by the way, are all grouuped by Tryon under the oldest name, lirulatus. Although Dall gives the range of succintusas ' south to San Diego' all my specimens are from Alaska. This is the smallest member of the group, with smooth, rounded whorls, grayish in color, with black spirals which usually show plainly within the aperture.

Carpenter's description of Margarites lirulatus calls for a shell with 2 cords on the spire and about 8 on the base. The type locality is Puget Sound. Oldroyd's figure (reporduced from Dall) does not show such a shell; neither have I seen it in any collection, but I have examined few specimens from Puget Sound. The portion of the description of lirulatus quoted by Oldroyd from Tryon applies to a composite of the three species, only the first portion apparently referring to the shell Carpenter had when he described lirulatus. Specimens with from 7 to 9 spiral cords are abundant in some Pleistocene deposits at San Pedro; also, I have them from 20 fathoms off South Coronado Island and off San Pedro, and from 30 fathoms off Catalina. These, however, nearly always have 3 spirals, which in many specimens are acute, and probably should be called M. lirulatus acuticostatus Carpenter. Shore specimens from Cayucos, Point Vicente and Todos Santos Bay and a small series from 10 fathoms off Santa Cruz Island, have about 5 basal cords, thus resembling the figures of Dall and Oldroyd. This is probably the shell Carpenter described as parcipiotus, which seems also to be a race of lirulatus . A few of my 20 specimens show a lesser number than 8 basal cords, thus indicating intergradation between parcipictus and lirulatus. Shore specimens from Ketchikan, Alaska are higher than typical, unclorored , with 2 cords on the spire, but only 5 on the base. These therefore, have the spire as described for typical lirulatus but the base of parcipictus. They may be Carpenter's M. lirulatus conicus. A small series from Point Reyes California given me by Dr. Gregg, are quite smooth, with an irregular number of spirals, and seem referrable to M. lirulatus obsoletus Carpenter.

Margarites optabilis Carpenter is figured by Oldroyd (copied from Dall) but, for some reason, the species is not included in her text. It is a pointed, grayish colored shell, occasionally longitudinally maculated with white, and more frequently with alternating white and dark spots on the peripheral keel. In my experience, this is an uncommon species, living, the only typical lot I have coming from 50 to 75 fathoms off Catalina Island. However, the large form, called M. optabilis knechti by Arnold is very abundant in the lower Pleistocene of San Pedro. Although this form has previously been reported as a fossil, and both Dall and Keen place the northern limit of the species optabilis in the vicinity of Santa Barbara, I have four specimens of M. optabilis knechti that were dredged off Forrester Island."

In the light of the above discussion there seems little question but that some lumping will ultimately be done with this group. However, at this time we will simply list the described species.

Margarites succinctus (Carpenter),1864. Sitka, Alaska (Dall) to Lower California (Keen). Type locality not given. / to San Martin Id., L.C.

Collecting data: Monterey on algae ('Burch); Grant Island, Alaska (G. Willett); Redondo Beach, Skagit Co., Wash. (Eyerdam); San Martin Island, L.C. (Dr. F. Baker); So. Coronado Island (Baker); Monterey (Hemphill); Ketchikan, Alaska (Willett) (San Diego Museum).

Margarites funiculatus (Carpenter),1864. Neah Bay, Wash.

Margarites optabilis (Carpenter),1864. Santa Barbara, Calif. south to Coronado Islands (Kelsey). Type locality: San Diego-San Pedro area.

Original description: " Wider(than M. parcipicta) : decussated between ribs: 2 spiral lines inside umbilicus."

Collecting data: Catalina Island in 30 fms. (Lowe); San Pedro and Monterey (Lowe); So. Coronado Island in 3 fms. Identified by Dall. ' Dr. F. Baker) (San Diego Museum).

Margarites optabilis knechti Arnold,1903. Forrester Island, Alaska (Willett) and Pleistocene of San Pedro, Calif. Type locality, Pleistocene of San Pedro.

Margarites lacunatus (Carpenter),1864. Neah Bay, Wash to San Diego,Calif. Type locality, Neah Bay.

Margarites parcipictus (Carpenter),1864. Sitka, Alaska to San Martin Island (Baker) and to Guadalupe Island (Strong and Hanna). Type locality, Neah Bay, Wash.

Collecting data: In our experience this is an extremely common small dredged shell. We have it dredged off Monterey in 10-40 fms.; off Redondo Beach in 20-50 fms.; off Avalon, Catalina Island in 35 fms. (Burch); off South Coronado Island and off San Martin Island (Dr. F. Baker); Puget Sound and San Juan Islands (T. Kincaid) ; San Pedro and Monterey (Lowe); San Geronimo Island (Lowe);

The subspecies M. p. pedroanus Arnold,1903 seems to be a fossil species so far not reported Living and should therefore probably better be dropped from our faunal list.

Margarites inflatulus Dall,1921. Puget Sound and Vancouver Island. New name for Margarita inflatula Carpenter.

Margarites lirulatus (Carpenter),1864. Port Etches, Alaska to San Diego. Type locality, Puget Sound and Vancouver Island.

Collecting data: Fauntleroy,Wash., Puget Sound, littoral; Monterey Bay in 10 fms. (Burch); Izhut Bay, Afognak Island, Alaska,1922 (Eyerdam); Catalina Island in 30 fms. (Lowe); Orcas Islanf (Dr. Baker); So. Coronado Island (Dr. F. Baker) (San Diego Museum).

Dr. A. Myra Keen advises on this species as follows (Per. Comm.) " In 1864 Carpenter says: M. lirulata , n.s. Small: operc. smooth: 2 sharp principal riblets on spire: outline variable. Var. subelevata, raised, livid: var.obsoleta , sculpture evanescent: var. conica, very tall with intercalary ribs, like G. parcipicta. All of these are listed as ' Puget Siund and Vancouver Island'. In 1865, Proc. ANSP, p. 61, he repeats this in Latin, with a few added words, as given by Mrs. Oldroyd. For conica he says: " t. valde elevata; lirulis acutis, aliis interdum intercalantibus; umbilico parvo. Long. .33, long. spir. .2, lat .25, div. 58." Puget Sound"

Margarites lirulatus conicus (Carpenter),1864. Grant Island, Alaska (Willett) to Puget Sound. Type locality, Puget Sound.

See discussion under lirulatus. Ketchikan,Alaska (Willett)

Margarites lirulatus obsoletus (Carpenter),1864. Puget Sound to San Diego.

See discussion under lirulatus. Midspit, San Diego Bay (Dr.F. Baker)

(con.)

M

Margarites subelevatus (Carpenter),1864. Neah Bay, Wash. to San Pedro(Lowe

Margarites acuticostatus (Carpenter),1864. Bodega Bay to Guadaluppe Island (Stronga nd Hanna). TType locality, Santa Barbara, Calif.
Collecting data: San Martin Island, L.C. (Dr. Baker); San Simeon, Calif. littoral;

Margarites althorpensis Dall,1919. Granite Cove, Port Althorp,Alaska in 14 fathoms.

Margarites smithi Bartsch,1927. Proc. U.S.N.M. 70:32
China Point,Monterey, Calif.

Subgenus Margarites s.s.

Margarites helicinus (Phipps),1774.all coasts of Bering Sea, to Catalina Island, Calif. Type locality, north side of Spitzbergen.
Collecting data: Grant Island, Alaska (G. Willett); Ketchikan,Forrester Island, San Lorenzo (Willett); Vancouver Island (Button); Hoonah, Alaska (Kate Stephens); Frenchman's Bay, Maine (Blaney) ((San Diego Museum); Drier Bay, Knight Island, 1923; Izhut Bay, Afognak Island,1922; Raspberry Strait, Raspberry Island, Alaska,1945; also Kobbebay, N. Spitzbergen, type locality, in 55 fms. clay coll. Odhner (W.J. Eyerdam).

Margarites helicinus excavatus Dall,1919. Amchitka and Middleton Islands, Alaska. Type locality, Constantine Harbor, Amchitka, Aleutians.

Margarites helicinus elevatus Dall,1919. Bear Bay, Baranoff Island, Alaska.

Margarites beringensis (Smith),1899. Arctic Ocean, Plover Bay, Commander Islands, and Petrel Bank, Bering Sea. Type locality, Commander Islands.

Margarites albolineatus (E.A. Smith),1899. All coasts of Bering Sea. Type locality, Commander Islands.

Margarites olivaceus (Brown),1827. St. Lawrence Island; Atka Island, Aleutians. Also Atlantic. Type locality, Greenock, Great Britain.
Collecting data: Dutch Harbor, Aleutians (Lowe).

Margarites pribilofensis Dall,1919. Arctic Ocean to off Pribiloff Islands, Bering Sea. Type locality, near Pribiloff Islands in 34 fathoms.

Margarites frigidus Dall,1919. Arctic Ocean and s outh to Nunivak Island, Bering Sea, a nd Windfall Harbor, Admiralty Islands, Alaska. Type locality, Arctic Ocean north of Bering Strait.

Margarites marginatus Dall,1919. Arctic Oceanand Bering Sea, south to Oregon; also Atlantic. Type locality, Adakh Island, Aleutians.
Collecting data: Mole Harbor, Alaska (Kate Stephens); Afognak Island Alaska (Baker); Knight Island (Baker) (San Diego Museum); " on kelp fronds and rocks; Iliuliul Harbor, Unalaska Island,1932; Izhut Bay, Afognak Island, 1922; Raspberry Strait, Raspberry Island, 1945 (Eyerdam).

Margarites hypolispus Dall,1919. Arctic Ocean north of Bering Strait.

Margarites tenuisculptus (Carpenter),1864. Puget Sound and Vancouver Island, to South Coronado Island (Dr. F. Baker).

Margarites umbilicalis (Broderip and Sowerby),1829. Arctic Coast. Circumboreal. Type locality, Oceano boreali.

Genus Margaritopsis Thiele,1906 (Nach. d. Deutsch. malak. Gessell., vol. 38, p. 15. Type (by original designation), Margarita frielei Krause. For description see Thiele's Handbuch, p. 46.

Margaritopsis frielei (Krause),1885. Bering Strait region. Type locality, St. Lorenzbai, one example (Krause).

Genus Gibbula Risso,1826. Type (by subsequent designation,Herrmannsen,1847), G. magus (Linnaeus) - Trochus magus Linnaeus.
" Shell conoidal, umbilicated; umbilicus cylindrical or infundibuliform; whorls frequently tuberculated above and with channeled suture; columella sometimes terminating in a tubercular tooth." (Tryon).

Gibbula adriatica canfieldi Dall,1871. Monterey to San Diego, Calif. Pleistocene. We have no Recent records of this species.

Family Cyclostrematidae (Vitrinellidae)

There has been some discussion of the proper family name to use. Dr. A. Myra Keen advises (Per. Comm.) " Since, according to Opinion 141 the oldest named genus in a family need not be taken as the type genus, Vitrinellidae can probably stand. However, I have not made an exhaustive search to see which family name was proposed the earliest.

Genus Vitrinella C.B. Adams,1850. Type (by subsequent designation, Bush,1897), Vitrinella helicoidea C.B. Adams.
" Shell small, thin, with a Helix-like low spire and a very wide umbilicus; sculpture absent except for growth lines; aperture ovate, with a margin projecting forward between the suture and the periphery of the body whorl; callus deposit on parietal wall. "
Grant and Gale comment " It is probable that Vitrinella should be considered a subgenus of Cyclostrema."

Reference- Baker, Hanna,and Strong,1938 " Proc. Calif. Acad. Sci. vol.23, no. 15, pp. 217-244, pls. 17-23. Excellent keys to the species of the genera covered.

Vitrinella williamsoni Dall,1892. San Pedro, Calif. to San Diego.
Collecting data: Laguna, Calif. (Lowe); Pt. Loma (Dr. Baker); Pleistocene of Baldwin Hills, Del Rey deposit (Burch).

Vitrinella oldroydi Bartsch,1907. Monterey to Pt. Abreojos,L.A. San Martin Island, L.C. Type locality, Point Loma, Calif.
Collecting data: Dredged off Monterey in 15 fms.; littoral at Cayucos, San Luis Obispo Co. on algae; also at San Simeon; La Jolla; dredged off Avalon, Catalina Island in 25 fms. (Burch); San Martin Island (Baker)
" Can be taken in fair quantity living on and around the tail valve of Ischnochiton conspicuus where the Ischnochitons are living in old Pholad holes or crevices in the ledges." (E.P. Chace).

* Note* Discussion continued bottom of Page 19.

Family Vitrinellidae

The following keys and lists are from Mr. A.M. Strong's notebook.

With a callus or pad restricting or covering the umbilicus ..*Teinostoma*
Without callus pad, openly umbilicated
. Outer lip sinuated or waved ....*Scissilabra*
. Outer lip not sinuated or waved
.. Shell naticoid, spire elevated .... *Ganesa*
.. Shell flattened, spire low or sunken
... Umbilicus with axial ridges or folds .... *Decomphala*
... Umbilical walls smooth
.... Spiral sculpture absent or confined to the umbilical region...
... *Vitrinella*
.... Spiral sculpture present
..... Entire surface with equal spiral threads of incised lines....
.. *Delphinoidea*
..... Body whorl with one to six spiral keels
...... Axial sculpture absent .... *Cyclostrema*
...... Axial sculpture present .... *Circulus*

Dall uses the genus *Ganesa* for several minute shells from the west coast. These seem to be quite different from the east coast shells usually placed in the genus.

Decomphala was suggested by Bartsch as a subgenus under *Vitrinella* for species having axial sculpture on the umbilical walls. As we have a species with similar umbilical sculpture but with strong spiral sculpture instead of the smooth surface of *Vitrinella* it seems best to use it as a genus.

Delphinoidea seems to be a valid generic name and is used to take the place of *Cyclostremella* used by Dall and Bartsch. The northern species placed by Dall in the genus *Leptogyra* do not seem to differ in any material way.

Bartsch has said somewhere that the material used by Carpenter in describing many species which belong in the family was so poor that it would be better to call them indeterminate. However, the descriptions in most cases are full enough to arrange them in genera and pick out specific characters. Where redescribed shells from Mazatlan are said to be the same as C.B. Adams shells from Panama it may be questionable. Dall and Bartsch have used different names for genera in most cases.

Genus *Ganesa*

Umbilicus emarginated
. Umbilicus bordered by a keel
Diam. 1.2 mm. Mazatlan .... *naticoides* Carpenter
. Umbilicus bordered by 12-15 spiral striae
Diam. 4.5 mm. Panama .... *panamensis* Dall
Umbilicus not emarginated
. Entire surface with subgranular vermiculations
Diam. 2 mm. Galapagos .... *piona* Dall
. Entire surface with thread like axial folds
Diam. 2.5 mm. Galapagos .... *filosa* Dall

See Dall in Proc. U.S.N.M., vol.56, p.368 for notes. I have not seen the paper by Miss Bush mentioned by him. None of these species have been figured and we have not placed any of them. Dall's species are from very deep water.

Genus Cyclostroma
Interspaces between cords or keels sculptured
. Spiral cords or keels more than 2
.. Spiral cords 3
... Umbilicus wide, open to the apex
Diam. 4.5 mm. San Pedro to Gulf of Calif. .... baldridgei Bartsch
... Umbilicus narrow, deep
Diam. 1.5 mm. Gulf of Calif. to Panama ....exigua C.B. Adams
.. Spiral cords or angulations 5-6
... Major cords smooth
Diam. 4.0 mm. Gulf of Calif. .... spiceri B.H. & S.
... All spiral sculpture nodulous or beaded
Diam. 2.28 mm. Tres Marias Islands .... mariae B.H. & S.
Interspaces between cords without spiral sculpture
. Axial sculpture of fine threads
.. Spire showing 1 spiral cord or angulation
... Base with 3 spiral cords or angulations
Diam. 1.4 mm. Cape San Lucas ....xantusi Bartsch
... Base with 2 spiral cords or angulations
.... Periphery flattened with a cord on each side
Diam. 0.9 mm. Panama .... perparva C.B. Adams
.... Periphery sharply keeled
Diam. 1.0 mm. Panama ....janus C.B. Adams
.. Spire showing more than 1 spiral cord or angulation
... Base with 2 spiral cords or angulations
Diam. 2.1 mm. San Pedro .... miranda Bartsch
... Base with more than 2 spiral cords or angulations
.... Spire nearly flat
Diam. 1.5 mm. Panama ....concinna C.B. Adams
.... Spire moderately elevated
Diam. 1.1 mm. Bahia Honda, Panama .... maccullochae S. & H.
. Axial sculpture consisting of distinct ribs
.. Spiral cords or angulation 6
Diam. 1.3 mm. Panama ....adamsi Bartsch
.. Spiral cords or angulations 2 to 3
... Base without spiral cords or angulation
Diam. 1.0 mm. Bahia Honda, Panama .... bartschi S. & H.
... Base with a spiral cord or angulation
.... Periphery flattened with a cord on each side
Diam. 0.8 mm. Mazatlan to Panama .... nodosa Carpenter
.... Periphery angulated with a cord on the angle
..... Shell flattly depressed
Diam. 1.0 mm. San Diego ....diegensis Bartsch
..... Shell moderately elevated
Diam. 1.3 mm. Panama .... adamsi Bartsch

Genus Circulus
Shell with one spiral cord on the angulated periphery
. Umbilicus broad, edge rounded
Diam. 2.2 mm. Panama .... diomedae Bartsch
. Umbilicus sharply angled at the edge
Diam. 3.1 mm. Taboga Island, Panama ...... nicholsoni S. & H.
Shell with more than one spiral cord
. Spire without spiral cords
.. Periphery with a rounded spiral cord
Diam. 1.2 mm. Mazatlan ....annulatus Carpenter
(con.).

•• Periphery flattened, a spiral cord on each side
Diam. 0.85 Mazatlan ....cinctus Carpenter.
• Spire with one or more spiral cords
•• Spiral cords confined to the peripheral region
Diam. 1.6 mm. La Paz ....lirops Bartsch
•• Spiral cords not confined to the peripheral region
••• Spiral cords 2 or 3
•••• Interspaces between cords with strong spiral threads
Diam. 1.5 mm. Tres Marias Islands .... madreensis B.H. &. S.
•••• Interspaces between spiral cords smooth or with fine striae
••••• Periphery rounded
Diam. 1.5 mm. Panama .... modestus C.B. Adams
••••• Periphery angulated
•••••• Spire moderately elevated
Diam. 1.8 mm. Panama ....tricarinata C.B. Adams
•••••• Spire depressed or sunken
••••••• Umbilicus bordered with a spiral cord
Diam. 2.5 mm. Panama ....valvatoides C.B. Adams
•••••• Umbilicus bordered with an angle only
Diam. 1.0 mm Mazatlan ....planospiratus Carpenter
••• Spiral cords more than 3
•••• Base with spiral cords
••••• Periphery angulated, with a cord on the angle
•••••• Umbilicus bordered by a spiral cord
Diam. 2.5 mm. Panama ....diomedae Bartsch
•••••• Umbilicus not bordered by a cord
Diam. 1.0 mm. San Diego ....cosmius Bartsch
••••• Periphery not angulated
•••••• Periphery rounded
Diam. 0.75 mm. Mazatlan .... carinulatus Carpenter
•••••• Periphery flattened, with a cord on each side
••••••• Base with decussated sculpture
Diam. 1.3 mm. Mazatlan .... bifrontis Carpenter

Genus Delphinoidea
Umbilicus restricted by the body whorl in the adult
• Shell subglobose Diam. 1.6 Tres Marias Ids. .... stephensae B.H. & S.
• Shell depressed, turbonate
•• Spire but slightly elevated
Diam. 3.2 mm. Taboga Island, Panama ...... hambachi S. & H.
•• Spire moderately elevated
Diam. 1.6 mm. Taboga Island, Panama ....hannai S. & H.
Umbilicus not restricted
• Umbilicus small, cylindrical
•• Shell depressed, discoidal
••• Base with spiral threads, spire smooth
Diam. 1.5 mm. Panama .... seminuda C.B. Adams
••• Entire surface with thin spiral ridges
Diam. 2.0 mm. Panama ....ponceliana de Folin
•• Shell turbonate
••• Spiral threads numerous equal close spaced
Diam. 2.0 mm. San Diego .... rossellina Dall
••• Spiral threads subequal, unequally spaced
Diam. 5.0 mm. Cape San Lucas ....granti B.H. & S.
(con.)

Genus *Scissalabra*

Axial sculpture present
• Sculpture finely decussated
•• Spire moderate elevated.
Diam. 1.4 mm. Mazatlan .... *monile* Carpenter
•• Spire flattened
Diam. 1.0 mm. Mazatlan .... *monilifera* Carpenter
• Sculpture not finely decussated
•• Body whorl with 1 spiral keel
Diam. 0.95 mm. Mazatlan ....*carinata* Carpenter
•• Body whorl with more than 1 spiral keel
••• Body whorl with 4 spiral keels
Diam. 1.25 mm. Mazatlan to Panama .... *parva* C.B. Adams
••• Body whorl with 5 spiral keels
Diam. 1.6 mm. Mazatlan to Panama ....*panamensis* C.B. Adams
Axial sculpture absent
• Whorls angulated
•• With a sharp angle at the periphery
Diam. 1.0 mm. Monterey to Gulf of Calif. .... *dalli* Bartsch
•• Broadly angulated below the periphery
Diam. 1.0 mm. Mazatlan ....*subquadrata* Carp.
• Whorls not angulated
•• Spiral sculpture present.
••• Spiral cords at the suture and periphery
Diam. 1.4 mm. Mazatlan .... *bifilata* Carpenter
••• Several spiral threads at the periphery
Diam. 0.8 mm. Mazatlan .... *orbis* Carpenter

Genus *Vitrinella*

Surface with irregular impressed lines
Diam. 2.1 mm. Cayucos to Pt. Sbreojos .... *oldroydi* Bartsch
Surface smooth or with fine lines of growth
• Umbilicus narrow, columellar walls straight
•• Umbilicus open to the apex
Diam. 1.9 mm. Gulf of California ....*tiburonensis* Durham
•• Umbilicus not open to the apex
Diam. 2.3 mm. San Pedro .... *eschnauri* Bartsch
• Umbilicus wide, columellar walls rounded
•• Shell flattened, spire scarcely elevated.
Diam. 5.5 mm. San Pedro ....*williamsoni* Dall
•• Shell turbonate, spire moderately elevated
••• Ratio of height to diameter 1 to 2.
Diam. 1.2 mm. San Pedro .... *smithi* Bartsch
••• Ratio of diameter to height 1 to 1.6
Diam. 1.6 Gulf of California .... *guaymasensis* Durham

Genus *Decomphala*

Early whorls with axial sculpture
• Spiral sculpture present
Diam. 2.42 mm. Cape San Lucas ....*lowei* B. H. & S.
• Spiral sculpture absent
Diam. 3.8 mm. Monterey to Newport .... *stearnsi* Bartsch
Early whorls without axial sculpture
• A single spiral keel on the base
Diam. 2.2 mm. Monterey to San Diego .... *berryi* Bartsch
• Three spiral keels on the periphery- Bahia Honda... *bakeri* S. & H.

• Umbilicus broad, open to the apex
•• Spire moderately elevated
Diam. 1.2 mm. Gulf of Calif. .... spiritualis B.H.& S.
•• Spire depressed
••• Apex lower than the last whorl
Diam. 2.3 mm. Monterey to San Diego .... californica Bartsch
••• Apex projecting slightly above the last whorl
•••• A smooth base between suture and first spiral
Diam. 1.5 mm. Cape San Lucas .... lucasana B.H. & S.
•••• Entire surface spirally threaded
••••• Spiral threads wavy, irregular
Diam. 1.3 mm. Gulf of Calif. .... dalli Bartsch
•••• Spiral threads subequal, equally spaced
Diam. 2.0 mm. Olga, Wash. .... concordia Bartsch

Genus Teinostoma
Shell angulated
• Periphery rounded - angulated at shoulder & middle/ of base
Diam. 1.5 mm. Bahia Honda, Panama ... oschnauri S. & H.
•• But one angulation
••• Angulated above the periphery
Diam. 2.0 mm. Monterey to Gulf of Calif. ......supravallata Carp.
••• Angulated at the middle of the base
Diam. 2.0 mm. Monterey to Gulf of California .. invallata Carpenter
Shell not angulated
• Whorls finely sculptured
•• Incised axial lines present
••• Spiral sculpture absent
Diam. 1.0 mm. Panama .... minuta C.B. Adams
••• Spiral sculpture present
•••• Last whorl not produced.
Diam. 1.2 mm. Mazatlan .... pyricallosa Carpenter
•• Incised axial lines absent
••• Spiral striae near the suture only
Diam. 1.0 mm. Mazatlan.....................substriata Carpenter
••• Spiral striae over entire surface
•••• Shell flatly depressed
Diam. 1.0 mm. Mazatlan .... lirulata Carpenter
•••• Shell subglobose, with a flattened spire
••••• Spiral striae subrugose
Diam. 1.1 mm. Mazatlan .... pallidula Carpenter
••••• Spiral striae very fine
Diam. 0.95 mm. Mazatlan................. tumens Carpenter
• Whorls smooth, without sculpture
•• Spire depressed, with flattly impressed sutures
••• Body whorl greatly produced
•••• Maximum diameter less than 3 mm.
Diam. 0.75 mm. Gulf of Calif. .... amplectans Carpenter
•••• Maximum diameter more than 3 mm.
Diam. 3.5 mm. Magdalena Bay............ cecinella, Dall
••• Body whorl not greatly produced
•••• Umbilical area with a small linguiform pad only
Diam. 2.0 mm. San Diego .... bibbiana Dall

(con.)

.... Umbilical area with more than linguiform pad
..... Callus leaving a slight umbilical chinck
Diam. 2.0 mm. San Pedro ....sapiella Dall
.. Spire moderately elevated
... An impressed line just below the suture
Diam. 1.75 mm. Panama .... regularis C.B. Adams
... Without an impressed line below the suture
.... With a minute umbilical dimple
Diam. 1.8 mm. Coronado Islands .... salvania Dall
.... With a distinct umbilical chink
Diam. 1.1 mm. Bahia Honda, Panama ...... hemphilli S. & H.

Genus Vitrinella C.B. Adams,1850
Vitrinella oldroydi Bartsch,1907 Cayucos to Pt. Abreojos
Vitrinella eschnauri Bartsch,1907 San Pedro
Vitrinella williamsoni Dall,1892 San Pedro
Vitrinella smithi Bartsch San Pedro
Vitrinella guaymasensis Durham Gulf of Calif.
Vitrinella tiburonensis Durham Gulf of Calif.
Genus Decomphala
Decomphala berryi(Bartsch),1907 Monterey to San Diego
Decomphala stearnsi(Bartsch),1907 Monterey to Reef Pt.
Decomphala lowei(Baker,Hanna and Strong) Cape San Lucas
Decomphala bakeri Strong and Hertlein Bahia Honda, Panama
Genus Delphonoidea Brown,1927
Delphinoidea californica (Bartsch),1907 Monterey to San Diego
Delphinoidea rossellina(Dall),1919 San Diego
Delphinoidea dalli (Bartsch),1911 Gulf of California
Delphinoidea lirulata (Carpenter),1856 Mazatlan
Delphinoidea decussata (Carpenter),1856 Mazatlan
Delphinoidea granti B. H. & S.,1938 Cape San Lucas
Delphinoidea lucasana B.H. & S.,1938 Cape San Lucas
Delphinoidea spiritualis B.H. & S.,1938 Gulf of Calif.
Delphinoidea stephensae B.H. & S.,1938 Tres Marias Islands
Delphinoidea seminuda (C.B. Adams),1852 Panama
Delphinoidea porcellina (de Folin) Panama
Delphinoidea hannai Strong & Hertlein Panama
Delphinoidea humbachi Strong & Hertlein Panama
Genus Cyclostrema Marryatt,1818
Cyclostrema baldridgei Bartsch,1911 San Pedro to Gulf of Calif.
Cyclostrema miranda Bartsch,1911 San Pedro
Cyclostrema diegensis Bartsch,1907 San Diego
Cyclostrema exigua (C.B. Adams),1852 Mazatlan to Panama
Cyclostrema nodosa (Carpenter),1856 Mazatlan
Cyclostrema coronata (Carpenter),1856 Mazatlan
Cyclostrema xantusi Bartsch,1907 Cape San Lucas to Panama
Cyclostrema ornata (Carpenter),1865 Mazatlan
Cyclostrema tenuisculpta (Carpenter),1865 Mazatlan
Cyclostrema lowei B.H. & S.,1938 Cape San Lucas - Decomphala-
Cyclostrema mariae B.H. & S.,1938 Tres Marias Islands
Cyclostrema spiceri B.H. & S.,1938 Gulf of California
Cyclostrema preparva (C.B. Adams),1852 Panama
Cyclostrema janas (C.B. Adams),1852 Panama
Cyclostrema concinna (C.B. Adams),1852 Panama
Cyclostrema adamsi Bartsch,1911 Panama

(con.).

Cyclostrema bartschi Strong & Hertlein Panama
Cyclostrema mcculloughi Strong & Hertlain Panama
Genus Circulus Jeffreys,1865
Circulus cosmia Bartsch,1907 ? Catalina- Ecuador
Circulus cerrosensis Bartsch,1907 Cerros Island to Gulf of California
Circulus annulata (Carpenter),1856 Mazatlan
Circulus planospira (Carpenter),1856 Mazatlan
Circulus cincta (Carpenter),1856 Mazatlan
Circulus carinulata (Carpenter),1856 Mazatlan
Circulus bifrontia (Carpenter) Mazatlan
Circulus verreauxii (Fischer),1857 Gulf of Calif.
Circulus liriope Bartsch,1911 La Paz
Circulus madreensis B.H. & S.,1938 Tres Marias Islands
Circulus modesta (C.B. Adams),1852 Panama
Circulus valvatoides (C.B. Adams),1852 Panama
Circulus tricarinata (C.B. Adams),1852 Panama
Circulus diomedae Bartsch,1911 Panama
Circulus bakeri Strong and Hertlein Bahia Honda,Panama- --Decomphala-
Circulus nicholsoni Strong & Hertlein Taboga Island, Panama
Genus Scissilabra Bartsch,1907
Scissilabra dalli Bartsch,1907 Monterey to Gulf of Calif.
Scissilabra parva C.B. Adams,1852 Mazatlan to Panama
Scissilabra panamensis C.B. Adams,1852 Mazatlan to Panama
Scissilabra subquadrata Carpenter Mazatlan
Scissilabra bifilata Carpenter Mazatlan
Scissilabra orbis Carpenter Mazatlan
Scissilabra monile (Carpenter),1857 Mazatlan
Scissilabra monilifera Carpenter Mazatlan
Genus Ganesa
Ganesa naticoides Carpenter Mazatlan
Ganesa panamensis Dall,1902 Panama
Ganesa piona Dall Galapagos
Ganesa filosa Dall Galapagos
Genus Teinostoma A. Adams,1854
Teinostoma invallata (Carpenter),1864 Monterey to Gulf of Calif.
Teinostoma supravallata (Carpenter),1864 Monterey to Gulf of Calif.
Teinostoma sapiella Dall,1919 San Pedro to San Diego
Teinostoma bibbiana Dall,1919 San Diego
Teinostoma salvania Dall,1919 Coronado Islands
Teinostoma cacinella Dall,1919 Magdalena Bay
Teinostoma gallegosi Jordan Magdalena Bay, Pleistocene
Teinostoma amplectans (Carpenter),1856 Gulf of Calif.
Teinostoma substriata Carpenter,1856 Mazatlan
Teinostoma pyricallosa (Carpenter),1856 Mazatlan
Teinostoma lirulata (Carpenter),1856 Mazatlan
Teinostoma tumens (Carpenter),1856 Mazatlan
Teinostoma pallidula (Carpenter),1856 Mazatlan
Teinostoma carinata (Carpenter),1856 Mazatlan
Teinostoma regularis C.B. Adams,1852 Panama
Teinostoma minuta C.B. Adams,1852 Panama
Teinostoma hemphilli Strong & Hertlein Taboga Island, Panama
Teinostoma oschneri Strong and Hanna Bahia Honda, Panama

The following genera are not represented in the California fauna, but are listed and discussed in Mr. A.M. Strong's notebook for the southern fauna.

Genus Discopsis
Discopsis panamensis Bartsch,1918 Panama
Discopsis argentea Bartsch,1918 Panama
Genus Gaza Watson,1879
Gaza rathbyni Dall,1889 Galapagos

Genus Coronado
Coronado simonsae Bartsch Coronado Islands
Genus Alleorus Strong
Alleorus deprellus Strong Gulf of California

Family Neritidae
Genus Nerita Lamarck
Nerita scabricostata Lamarck,1822 Lower Calif. to Peru
Nerita bernhardi Recluz,1850 Lower Calif. to Peru
Nerita ornata Sowerby,1824 Nicaragua to Panama
Nerita cerostoma Troschel,1852 Peru
Genus Neritina Lamarck
Neritina picta Sowerby,1832 - usurptrix Cross & Fischer Magdalena Bay-Panama
Neritina cassicula Sowerby Gulf of Calif.
Neritina califprnica Reeve Gulf of Calif.
Neritina latissima Broderip,1832 Costa Rica to Peru
Neritina sobrina Recluz,1849 Peru
Neritina owenii Mawe Costa Rica and Peru

Genus Phenacolepas
Phenacolepas magdalensis Dall,1918 Magdalena Bay
Phenacolepas osculans C.B. Adams,1852 Gulf of Calif. to Panama
Phenacolepas malonei Vanatta,1912 Santa Rosalia

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Discussion of Vitrinella continued from bottom of Page 11 .

Vitrinella eshnauri Bartsch,1907. Monterey to San Diego to Scammons Lagoon Type locality, San Pedro.

Collecting data: Dredged off Avalon, Catalina Island in 35 fms. (Burch) San Pedro (Lowe); Pt. Loma (Dr. Baker); Reef Point, 10 fms. (Strong); Scammons Lagoon (Baker).

Vitrinella alaskensis Bartsch,1907. Unalaska, Alaska.

Genus Docomphala Bartsch,1907. Type (by original designation), Vitrinella stearnsii.

Docomphala stearnsii(Bartsch)1907 Monterey, Calif. to South Coronado Island. (Baker). Type locality, Monterey.

Collecting data: Dredged off Redondo Beach in 25 fms. gravel (Burch); off South Coronado Island in 18 fms. (Dr. F. Baker); Not uncommon in the Pleistocene of Timm's Point, San Pedro, Calif. (Burch)

Docomphala berryi (Bartsch),1907. Monterey to So. Coronado Island. Type locality, off Del Monte, Monterey.

Collecting data: Dredged off Malaga Cove, L.A. Co. in 20 fms. (Burch); So. Coronado Island in 18 fms. (Baker); Bird Rock (Baker).

Docomphala columbiana Bartsch,1921. Proc. Biol. Soc. Wash. 34:39
Departure Bay, British Columbia.

Vitrinella smithi Bartsch,1927. White's Point, Los Angeles Co., Calif.to South Coronado Island (Dr. F. Baker).
Type locality, White's Point, San Pedro.

Genus Cyclostrema Marryatt,1818. Type (by monotypy), C. cancellata Marryatt.

" Shell orbicular, depressed, widely umbilicated, spire short; whorls transversely striated or cancellated; aperture round, not nacreous; peristome continuous, simple." (Tryon).

Cyclostrema diegensis Bartsch,1907. San Diego, Calif.

Cyclostrema miranda Bartsch,1921. San Pedro, Calif. to Point Loma (Baker)
Type locality, San Pedro.

Cyclostrema baldridgae Bartsch,1911. San Pedro to Gulf of Calif.
Type locality, Gulf of Calif.
Collecting data: Dredged near Fort Rosecrans, Pt. Loma (Dr. F. Baker).

Genus Circulus Jeffreys,1865 Type (by monotypy), Delphinula duminyi Requien,1848 = Circulus striatus (Philippi),1836.

Circulus rossellinus Dall,1919. San Diego to Guadalupe Island (Strong and Hanna). Type locality, off South Coronado Island in 3 fathoms.

Circulus cosmius Bartsch,1907. Catalina Island, Calif. to Ecuador.
Type locality, near Atacamos, Ecuador.

Genus Skenea Fleming,1825. Type (by subsequent designation, Gray, 1847), Helix serpuloides. (Delphinoidea Brown,1827).

Dr. A. Myra Keen advises on this genus as follows (Per. Comm.)
" Delphinoidea Brown,1827, seems to be an exact synonym of Skenea Fleming , 1825, having the same type by subsequent designation (Gray,1847): Helix serpuloides Montagu. For discussion see Iredale, Proc. Malac. Soc. vol. 11, 1915, p. 292."

Skenea californica (Bartsch),1907. Monterey to Point Abreojos (Jordan).
Type locality, Long Beach, Calif.
Collecting data: Point Loma, San Diego Co. (Baker).

Skenea concordia (Bartsch),1920. Olga, Washington.

Skenea coronadoensis(Arnold),1903. Mem. Calif. Acad. Sci. vol.3, p. 320, 1903/
Collecting data: Spanish Bight, San Diego (Kate Stephens); Todos Santos Bay (Burch).

Genus Scissilabra Bartsch,1907. Type (by original designation), Scissilabra dalli Bartsch.

Scissilabra- " Vitrinella-like shells with the middle of the outer lip deeply and broadly notched, the center of the notch coinciding with the periphery of the shell" (Bartsch).

Dr. Joshua L. Baily Jr. comments on this (Per. Comm.) " Genus Scissilabra. I do not know this genus. The name means split lip, which suggests that it would be more appropriately placed in the Scissurellidae. I have collected both species of Teinostoma , and believe that the channel parallel to the suture of one of them indicates close relationship to the Scissurellidae, but not close enough to be transferred to that family. These species were formerly included in the genus Ethalia . I am not familiar with the types of these genera, but am inclined to believe that if Teinostoma has such a channel and Ethalia does not, or vice versa, these two species should be placed in separate genera. If you can find out what the type of Ethalia is, I would suggest that this genus should be included in the faunal list, even though it may not be represented in the faunal area which you are covering."

Scissilabra dalli Bartsch,1907. Monterey, Calif. to the Gulf of California
Type locality, San Diego, Calif.

Dr. A. Myra Keen writes on this species (Per. Comm.) " In Mrs. Oldroyd's " Marine Shells", vol. 2, pt.3, pl. 104, figs. 10-12 are not of Scissilabra dalli but of Cyclostremella dalli Bartsch, from the Gulf of California. "

Genus Leptogyra Bush,1897. Type (by original designation), L. verrilli Bush.

Mr. Strong placed this under Skenea, or rather Delphinoidea in his usage.

The complete and rather detailed generic description is given by Oldroyd vol.3, p. 225.

Leptogyra alaskana Bartsch,1910. Port Graham, Cook's Inlet, Alaska.
Type locality, Port Graham, Alaska.

Genus Teinostoma H & A. Adams, 1854. Type (by subsequent designation, Cossmann) 1888), T. politum A. Adams.

" Shell orbicular, depressed, subspiral, polished or spirally striated, last whorl rounded, or angulated at the periphery; umbilical region covered with a large, flat callosity; aperture transverse; inner lip smooth, callous; outer lip thin, simple, not marginated or reflected." (Tryon).

Dr. A. Myra Keen advises on this genus as follows (Per. Comm.) " As Teinostoma is a neuter noun, all adjectival endings should be in -um, as supravallatum, invallatum and bibbianum. The names sapiella and salvania may be nouns in apposition, though Dall's intention is not clear. The original description of T. supravallatum Carpenter,1864 is : " Minute, with keel and furrow near suture."

Teinostoma supravallatum (Carpenter),1864. Monterey to Gulf of Calif.
Type locality, an advice of Dr. Keen " San Diego according to the holotype label in the U.S.N.M."

Collecting data: Dredged off Avalon, Catalina Island in 35 fms.; Malaga Cove littoral; Punta Banda, L.C.; Dana Point, Orange Co. (Burch); San Diego (Hemphill and Baker); La Jolla and Bird Rock(Bristol);S. Coronado Id.(Baker)

Teinostoma invallatum (Carpenter),1864. Monterey to the Gulf of Calif.
Type locality: San Diego.

Collecting data: Malaga Cove, L.A. Co., littoral; (Burch); Point Loma, San Diego Co. (W.K. Emerson); San Diego (Hemphill and Baker); Laguna Beach (Lowe); So. Coronado Island (Baker) (San Diego Museum).

Genus Pseudorotella Fischer,1857. Type (by monotypy), Rotella semistriata d' Orbigny. (fide Woodring,1928, p. 445)

" Shell small, moderately thin or thick, circular, spire low. Outer lip, as viewed from above, arched backward between the suture and periphery. Basal lip, as viewed from below, arched backward. Umbilicus covered with moderately thick subcircular callus that covers only small part of base and fails to reach suture. Parietal callus overlapping only small part of umbilical callus, thickened and slightly channeled where it meets outer lip, extending down on part of basal lip as very narrow border causing it to appear everted. Sculpture (of type species) consisting of very fine spiral threads on spire and on upper part of body whorl." (Woodring,1928, p.445).

Pseudorotella sapiella (Dall),1919. San Pedro to San Diego, Calif.
Type locality, San Pedro, Calif.

Collecting data:, Laguna Beach, Calif. (Brown).

Pseudorotella bibbiana (Dall), 1919. San Diego, Calif.

Pseudorotella salvania (Dall), 1919. Off Coronado Islands.

Genus Solariorbis Conrad,1865. Type (by subsequent designation Dall,1892), Delphinula depressa Lea.

This entire genus and the species under it from San Pedro seems to have been ommited from Mrs. Oldroyd's work. We will therefore run the complete descriptions.

" Shell medium sized, moderately thick, spire low. Nucleus consisting of a few smooth whorls. Aperture flattened at base. Parietal callus thin. Outer lip as viewed from above , bent backward near periphery, distinctly channeled at junction with parietal callus. Inner lip thickened by a smooth area spirally arranged around umbilicus and resembling callus. Sculpture (of type species) consisting of punctate spiral grooves and obscure axial threads" (Woodring,1928, p. 443).

Solariorbis arnoldi Bartsch,1927. Proc. U.S.N.M. vol. 70:32,33, pl. 6, figs. 7,8,9. San Pedro, California.

." Shell large, lenticular, semitranslucent, bluish white. Nuclear whorls 1.2, well rounded, smooth. Postnuclear whorls moderately rounded, almost appressed at the summit, the first marked by six interrupted lines of pits and two slender spiral striations near the summit. As the whorls progress the pits become more or less fused into incised spiral lines, of which 7 occur upon the second and 24 upon the last whorl. In addition to the spiral sculpture, the whorls are marked by slender, somewhat irregular retractively slanting axial threads. Periphery of the last whorl slightly obtusely angulated. A rather broad band immediately below the periphery is devoid of spiral sculpture. Base broadly openly umbilicated; the posterior half marked by incised spiral lines which leave the elements between them as moderately broad, flattened cords and numerous lines of growth. The latter

(con.)

are a little rougher at the umbilical angle than on the flattened base. The umbilicus shows all the turns within it. Aperture decidedly oblique, oval; posterior angle with a slender sinus; outer lip thin, showing the external sculpture by transmitted light; inner lip heavy, thickened, curved; parietal wall covered with a rather thick callus that renders the peristome complete.

The type, Cat. No. 363784, U.S.N.M., was collected by Delos Arnold at San Pedro, California. It has three and one half whorls and measures, length 4 mm; height, 1.8 mm; greater diameter, 4.3 mm."

Family Scissurellidae

Genus *Scissurella* Orbigny,1824 Type (fide Winckworth,1932), *S. costata* Orbigny.

" Shell minute, thin, not pearly; body whorl large; spire small; surface striated; aperture rounded, with a slit in the margin of the outer lip ; operculate. The young have no slit." (Tryon).

Scissurella kelseyi Dall,1905. Queen Charlotte Islands, B.C. to South Coronado Island. Type locality, off San Diego.

Scissurella chiricova Dall,1919. Southeast of Chirikoff Island, Alaska in 695 fathoms.

Genus *Schismope* Jeffreys,1856. Type (by monotypy), *Schismope striatula* (Philippi).

" *Schismope* is a *Scissurella* in which the anal slit becomes closed in the adult, and transformed into an oblong perforation like one of the holes of a *Haliotis*. It bears much the same relation to *Scissurella* that *Trochotoma* does to *Pleurotomaria*. The species inhabits deep water; there are a number of fossil forms described." (Tryon and Pilsbry,Man. Conch.)

In the discussion of the species of *Schismope* Dr. A. Myra Keen writes on one as follows (Per. Comm.) " " In the " Emendations to Bull. 112", 1923, Dall cites *Schismope californica* Bartsch as a substitute for *S. coronata* Watson,1886, as used in Bull. 112. However, as Watson 's shell referred to in Bull. 112 was from Tahiti and there is no word of diagnosis or description nor figure of the California *Schismope*, it seems to me that *S. californica* Bartsch in Dall,1923 must be regarded as a *nomen nudum*."

Schismope rimuloides (Carpenter),1864. South Coronado Island to Mazatlan, Mexico. Type locality: Mazatlan.

Genus *Tornus* Turton in Carrington,1830. Type (by monotypy), *Helix subcarinata* Montagu.

Dr. A. Myra Keen advises on this species as follows (Per. Comm.) " According to Dall in the " Emendations to Bull. 112", *Schismope caliana* should be allocated to *Adeorbis* S. Wood,1842. *Adeorbis* S. Wood,1842 seems to be a synonym of *Tornus* Turton in Carrington,1830. (Teignmouth, Dawlish and Torquay Guide, sign. G-2, fife Sherborn). Type (by monotypy), *Helix subcarinata* Montagu. Turton's original description,as quoted by Iredale,1915 (Proc. Mal. Soc. vol. 11, 1915, p. 173) is: " Shell orbicular, depressed; aperture oval or rounded, pillar none. Operculum horny"

Tornus calianus (Dall),1919. San Diego, California.

Family Fissurellidae

Shell with a marginal sinus at the end of the rib..........Hemitoma
Shell with a small perforation midway on the end ...... Rimula
Shell with an apical perforation or orifice
• Perforation bounded internally with a raised edge..Puncturella
• Perforation bounded by a smooth callus ridge
•• Perforation large, ¼ to 1/3 the length of the shell
(Animal larger than the shell)
••• Adult shell large, 75 to 100 mm. in length....... Megathura
••• Adult shell small, less than 25 mm. in length
•••• Sculptured with unequal, scaly radial ribs.... Lucapinella
•••• Radial ribs equal, nearly smooth ....Megatebennus
•• Perforation small, less than ¼ the length of the shell
(Animal contained in the shell)
••• Internal callus truncated posteriorly .... Diadora
••• Internal callus not truncated ....Fissurella

Genus Hemitoma

Radial ribs strong, imbricated by lines of growth
Length 50 mm. Forrester Island to Catalina ..... yatesii
Shell smaller, sculpture finer
Length 14 mm. Santa Cruz to San Pedro .... bella

Genus Rimula

Outer surface delicately cancellated
Length 3 mm. San Martin Island to Gulf of Calif. ...mazatlanica

Genus Puncturella

With wide spaced radial ribs and close concentric threads
• Intercalary radial riblets present
•• Major radial ribs about 20
Diam. 15 mm. Alaska to La Paz .... cucullata
•• Major radial ribs about 30
Diam. 27 mm. Alaska to San Diego ....multistriata
• Intercalary radial riblets absent
Chile to Patagonia .... falklandica
Tryon vol.12, p.231, pl.63, fig.23
With many nearly equal radial threads
• Shell high, conic
•• Internal laminae supported by a transverse rib
Diam. 10 mm. Alaska to San Pedro .... galeata
•• Internal laminae without props.
Diam. 7.5 mm. Alaska to San Pedro .... cooperi
• Shell subcylindrical, minute, radial threads strong
San Diego ....carophylla
• Shell low, expanded
Diam. 32 mm. Panama to Galapagos .... expansa
Bull. Mus. Comp. Zool. 43: 353, pl.4, figs 5-10-11

Genus Megathura

Radial and concentric ridges fine,close, equal
Length 100 mm. Monterey to Cerros Island .... crenulata

Genus Lucapinella

Radial ribs imbricated by strong lines of growth
Length 20 mm. Bodega Bay to Peru .... callomarginata

(con.)

Surface decussated by radial and concentric ridges
Central America .... aequalis
Tryon 12:197, pl.31, fig.24; Reeve, fig.55

Genus Megatebennus
Sculptured with rounded radial ribs
Length 20 mm. Forrester Island to Cape San Lucas ...bimaculatus
Sculptured with sharp radial grooves
Length 27.5 mm. Peru ....corkeri
Proc. U.S.N.M.37:243, pl.24, fig. 3-7.

Genus Diadora
Anterior and posterior slopes nearly straight
. Radial ribs unequal, concentric ridges forming scales
Length 45 mm. Alaska to Magdalena Bay .... aspera
. Radial ribs subequal, nodulous
Monterey to San Quentin Bay .... densiclathrata
Reeve pl. fig.64
Posterior slope humped behind the perforation
. Radiating ribs and concentric ridges equally strong
.. Perforation sub-central
Santa Barbara to Ecuador .... inaequalis
.. Perforation at about the 1.3 point
Length 10 mm. Gulf of Calif. to Panama ....saturnalis
Ann. Mag. Nat. Hist. 13:475
. Radiating ribs strong, concentric ridges delicate
Peru .... asperior
Reeve pl.5, fig.30; Tryon, 12:214, pl.30, fig.6
Anterior and posterior slopes nearly equally convex
. Surface between strong radial ribs finely cancellated
Length 10 mm. Gulf of Calif. to Peru .... panamensis
Reeve pl.12, fig.87; Tryon 12:216, pl.32, fig. 35
. Surface decussated by unequal radial and concentric ridges
Length 20 mm. Peru .... fontianiana
Tryon 12:207, pl.62; figs 28-29-30

Genus Fissurella
Margin of shell crenulated
. Inner margin dark bordered
.. Outer surface with radial and concentric sculpture
Chile .... philippiana
.. Outer surface with delicate radial sculpture only
Length 20 mm. Mazatlan ....nigricincta
. Inner margin not black bordered
.. Outer surface with major and minor radial ribs
... Major radial ribs few, prominent
.... Margin scalloped between 8 major ribs
Length 30 mm. Gulf of Califl to Peru .... rugosa
.... Margin regularly ovate
Length 30 mm. Gulf of Calif. to Peru .... obscura
... Major radial threads small, numerous
Length 55 mm. Gulf of Calif. to Peru .... virescens
.. Outer surface with subequal radial riblets or striae
... Riblets subrugose, obscurely nodulous
Panama .... ostrina
(con.)

••• Striae numerous, surface roughened with raised dots
Peru ....asperella
Margin of shell not crenulated, inside dark bordered
• Interior of shell deeply wrinkled
•• Outer surface with radial and concentric undulations
Length 85 mm. Panama to Peru .... crassa
• Interior of shell not deeply wrinkled
•• Outer surface with radial and concentric sculpture.
••• Shell conical, elevated
Length 82 mm. Ecuador to Chile..................... picta
••• Shell more or less depressed
•••• Radiating ribs nodose, with intermediate striae
Central America .... crenifera
•••• Radiating ribs close, equal
Chile ....obovalis
•••• Radiating grooves close-set, concentric striae fine
Length 40 mm. Panama to Magellan Straits .... mexicana
•••• Sculpture fine, more or less obsolete
Chile .... fulvescens
•• Outer surface with radiating ribs or striae only
••• Shell conical, elevated
•••• Ribs rude, here and there larger
Crescent City to Panama .... volcano
•••• Every 3rd to 7th riblet larger
Length 35 mm. Mazatlan to Peru .... peruviana
•••• Fine radiating striae, coarser near the margin
Length 90 mm. Chile ....punctatissima
•••• Striae fine, nearly obsolete
Length 100 mm. South America .... nigra
••• Shell more or less depressed
•••• Shell oval or circular
••••• Ribs distant, prickly nodose
Ecuador ....clypeus
••••• Ribs variable, uneven or nodulouse
8 mm. Gulf of Calif. ....alba
••••• Riblets strong, rough, subequal
Length 74 mm. Panama to Chile .... costata
•••• Shell ovate to elliptical
••••• Ribs rather weak, uneven or tuberculate
Length 100 mm. Peru and Chile .... maxima
••••• Fine radial striae over entire surface
Length 68 mm. Chile ....latimarginata
•• Outer surface without radial sculpture
••• Surface with evident lines of growth, shell conical
Shell 77 mm. Chile .... limbata
••• Surface with fine concentric striae, shell depressed
Length 54 mm. Chile .... pulchra
••• Surface with a spongy texture, shell elongated
Length 17.5 mm. Gulf of Calif. .... spongosa

Genus Fissurella Bruguiere,1791
Fissurella volcano Reeve,1849 Crescent City to Panama
Fissurella obscura Sowerby,1834 Lower Calif. to Peru
Fissurella virescens Sowerby,1835 Gulf of Calif. to Peru
Fissurella rugosa Sowerby,1835 Gulf of Calif. to Panama

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Fissurella nigrocincta Carpenter,1855 Mazatlan
Fissurella alba Carpenter,1857 Maazatlan
Fissurella spongiosa Carpenter,1857 Mazatlan
Fissurella peruviana Lamarck,1822 Gulf of Calif. to Peru
Fissurella mexicana Sowerby, Mexico to Magellan Straits
Fissurella crassa Lamarck,1822 Panama to Peru
Fissurella nigra Lesson,1830 Peru to Magellan Straits
Fissurella philippiana Reeve,1849 Chile
Fissurella ostrina Reeve,1849 Panama
Fissurella crenifera Sowerby,1834 Central America
Fissurella latimarginata Sowerby,1834 Peru and Chile
Fissurella picta Gmelin,1791 Ecuador and Chile
Fissurella clypeus Sowerby,1834 Ecuador
Fissurella maxima Sowerby,1834 Peru and Chile
Fissurella asperella Sowerby,1835 Peru
Fissurella costata Lesson,1830 Peru and Chile
Fissurella fulvescens Sowerby,1834 Chile
Fissurella limbata Sowerby,1834 Chile
Fissurella obovalis Lesson,1830 Chile
Fissurella pulchra Sowerby,1834 Chile
Fissurella punctatissima Pilsbry,1890 Chile
Fissurella concinna Philippi Talara,Peru
Genus Megathura Pilsbry,1891
Megathura crenulata(Sowerby)1825
Genus Megatebennus Pilsbry,1890
Megatebennus bimaculatus Dall,1871 Forrester Island to Tres Marias Islands
Megatebennus corkeri Dall,1909 Peru
Genus Lucapinella Pilsbry,1890
Lucapinella callomarginata (Dall),1871 Bodega Bay to Peru
Lucapinella aequalis (Sowerby),1834 Central America to Ecuador
Genus Diadora Gray,1821
Diadora aspera Eschscholtz,1833 Cooks Inlet to Lower Calif.
Diadora densiclathrata Reeve,1850 Monterey to San Quentin Bay
Diadora murina Dall,1885 Crescent City to Magdalena Bay
Diadora alta (C.B. Adams),1852 Panama
Diadora pananensis Sowerby Gulf of Calif. to Peru
Diadora fontainiana (d'Orbigny),1841 Peru
Diadora asperior (Dall),1909 Peru
Genus Puncturella Lowe,1827
Puncturella cucullata Gould,1846 Alaska to La Paz
Puncturella galeata Gould,1846 Alaska to San Pedro
Puncturella cooperi Carpenter,1856 Alaska to San Pedro
Puncturella multistriata Dall,1914 Alaska to Cortez Bank
Puncturella carophylla Dall,1914 San Diego
Puncturella (Cranopsis) expansa Dall,1896 Galapagos
Puncturella (Cemoria) falklandica (A. Adams),1862 Chile to Patagonia
Genus Rimula
Rimula mazatlanica Carpenter,1857 San Martin Island to Mazatlan
Genus Hemitoma Swainson,1840
Hemitoma yatesii Dall,1901 Forrester Island to Panama ?
Hemitoma bella Gabb, 1865 Santa Cruz to San Pedro
Hemitoma golischae Dall,1916 San Nicholas Island
Hemitoma hermosa Mawe Gulf of Calif.

* Note* Discussion of Haliotidae and Fissurellidae will appear in our next issue.

Note to the members from the editor- My business is going to compell me to be away in the northern part of the state a good part of this spring, so if the delivery of the Minutes is a bit irregular you will know why.

A word to our many exchange correspondents should be in order also. Aside from the daily struggle to earn a living I seem to be devoting all of my spare time to getting out these Minutes and have had little or no time for either collecting or working with my duplicates. However, I am still very much interested in building up my collection as well as my library. All contributions sent me will be gratefully received and at present about the only return I am able to make is in my efforts with these papers. Many of my correspondents have been remembering me with bozes of shells and I wish to thank them.

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Mr. H.J. Koch, P.O. Dynamite Factory, Somerset West, South Africa.

" I must thank you for your prompt attention and for a copy of the Minutes. I found them most instructive and would be glad of back issues. I would like to contribute to your club if you are agreeable.

I am afraid that I did rather get the impression that yours was a business and not a scientific club as it really is. I am willing to help within the limits of the time at my disposal and will do my best to arrange exchanges with some of your members, two of whom have already written.

I look forward to receiving the books. We are very badly off for literature in this country and any suggestions you may be able to make with regard to good books to get I should be grateful for.

I will close with thanks and express my pleasure at having made contact with your organization. My wife who is also working on molluscs (we both do it as a hobby) joins with me in expressing these sentiments."

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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA

May 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965

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NOTES ON LIVING CALIFORNIA CREPIDULAS

by Allyn G. Smith

The white Crepidulas of the subgenus Ianacus Morch,1852, of the West Coast of North America have been a problem for conchologists at least since Broderip's time, judging by the number of names given to them. They are found in all sorts of locations, giving rise to many situs forms. The existing problem is first to consider what names are available, and then apply these to the appropriate species under the rules of nomenclature.

Probably no two conchologists today would agree on a settlement of these two problems, so it is with some hesitation that the following discussion and opinions are offered in the hope that they may lead to a consensus on what the answers should be.

Crepidula nummaria Gould,1846.

This is a fine, large, distinct species, easily identified by the thick, golden-brown periostracum, which normally covers the shell although in old specimens it may have been worn off to some extent. The type locality is the Strait of Juan de Fuca and it has been found fairly commonly on the coasts of San Luis Obispo, Sonoma, and Mendocino counties . It has not been reported from Monterey, apparently skipping that region. There are lots in the collection of the California Academy, which are apparently this species from Tepoca Bay, Lower California; from Freshwater Bay, Tiburon Island in the Gulf; and from Magdalena Bay. Whether the range extends as far south as Mazatlan appears open to question and needs confirmation, as the species seems to flourish in colder waters. Under favorable conditions on the California coast nummaria grows a circular shell, as refigured by Oldroyd in her plate 91, figures 14,14a, and 14b. This shape is not the usual one, however, as subtriangular and subquadrate shapes are more often found, expecially in older and larger specimens. Nummaria grows a thick heavy shell and is by all odds the largest of the northern California Crepidulas. Because of its periostracum its outer surface is usually fairly clean, without the incrustations of worm-tubes, barnacles, and bryozoans generally occuring on another species of Crepidula occasionally collected from the under side of the same rock inhabited by a colony of nummaria.

(con.)

***NOTE- This issue will serve for May and June- next issue July

The three lots from Lower California and the Gulf do not have quite as heavy a periostracum, which tends to be lighter in color than on shells from California. In addition, the southern shells have a groundwork sculpture of rather irregular, somewhat wavy, fine striations, which are absent on the California specimens. Whether these differences constitute specific subspecific, or lesser factors cannot be told for certain from the few lots now available and a final determination of this must await the collection of more material.

Johnson and Snook, in discussion nummaria (page 538) appear to refer to another species. Their figure 601 (page 537) looks like a form of C. nivea C.B. Adams, but side and back views would be needed to identify this shell with certainty.

There has been considerable confusion between nummaria, and Adam's nivea and other white species but the presence of the heavy and sometimes shaggy golden-brown periostracum of the former would appear to be an ample distinguishing feature.

Crepidula nivea C.B. Adams,1852.

The type locality is Panama; Oldroyd gives the range from Puget Sound to Panama. The species is omitted from Dall's Bull. 112 and Dr. Myra Keen's Check List places it in the synonymy of nummaria, which the writer believes is incorrect in view of the evidence now on hand. Mrs. Oldroyd gives two fairly good figures of what she identified as nivea (plate 93, figs. 7,9), the latter one of a shell partially suffused with brown that she cites as a " color form". These illustrations do not appear to be the true nivea, as the writer understands it, but of another white species, C. perforans Val. to be discussed later.

Examination of a number of lots of C. nivea , or forms of it, in the California Academy's collection leads to the conclusion that it is a recognizable species that varies in size and shape to a considerable degree. The form considered to be true nivea differs from the other white Crepidulas from northern California in the following respects: (1.) It has an extremely thin, papery, colorless or very light yellow periostracum, which, in old and worn specimens, may show only in traces, and then only at the margins. This is a feature not mentioned by Adams in his original description, which may be accounted for by Carpenter's observation (1872-37) that Adam's' " type specimens are small, poor, and rough, of the var. striolata , passing into lessonii." (2.) The notch, or sinus, at the left-hand margin of the deck is deep and V-shaped, although in some specimens from San Pedro that are referred to this species, this notch is more nearly U-shaped and not as deep. (3). Specimens are frequently rather large, broad flat, and cuneate with the narrower end toward the apex. This is thought to be the normal form in which the shell has had an unrestricted growth. Like many Crepidulas , however, the shape of the shell varies with the situs.

Among the Academy's lots of Crepidula from the southern fauna there are a few shells of the general form of nivea, but which differ in having a series of well-incised, interrupted striations radiating from apex to margin. In some others these striae are weak or hardly noticeable. These are thought to be the form striolata Menke, mentioned above by Carpenter . This particular form is not found in California, so far as known.

There seems to be good evidence that C. nivea does extend into California. The situs form glottidiarum Dall,1905, in the writer's opinion was properly allocated to nivea by Mrs. Oldroyd. It has the thin, papery periostracum of a totally different nature from that of nummaria, to which it does not appear to be at all closely related, as Dall indicated it in Bull. 112. Specimens of the broad and cuneate, flat form of *nivea* with traces of periostracum are in both the writer's, the Gordon, and the California Avademy's collection from San Pedro. How much farther north it is to be found is not known, nor can further information be given on any extension of the southern end of the range below Panama.

Before leaving *nivea*, it seems necessary to observe that the shells from San Pedro mentioned above are hardly to be distinguished from shells of *C. plana* Say collected on the Atlantic coast. While there are minor differences between the shells of both coasts, these are of such small consequence that they seem hardly worth mentioning. This poses a real problem, for the true *C. plana* has been introduced with seed oysters from the east coast to Willapa Bay, Washington, where it has bceome established and seems to flourish. Whether the warm water *C. nivea* and the colder water *C. plana* are conspecific will be known only from a comparison of their radulas and soft parts. Until this has been done, it might be best to consider them separate even though the shells cannot be told apart, at least in some instances.

Crepidula perforans Valenciennes,1846.

No type locality or description of this species was given in the original publication but the published figures (Voy. Venus, 1846; pl.24, figs. 9, 9a,9b) show an elongate, somewhat frilled, white shell similar to the form commonly found in pholad holes in the shale bed off Monterey and at other points along the California and Lower California coast. This is the oldest name attributed to a white species without periostracum similar to those which come from California. Carpenter (1856:281; 1872:52) first shows it as a synonym of *C. exuviata* Nuttall, along with *C. explanata* Gould. Later 1864:654; 1872:140) he considered it a " variety" of *C. navicelliodes* Nuttall, stating it is " elongated in crypts scooped out by crab or bivalve- *explanata* Gld.- *exuviata* Nutt. - *perforans* Val.

Crepidula explanata Gould,1853.

The type of this species was given by Gould as Monterey. The most recent published figures (Oldroyd, plate 85, figs. 7,8, as *C. exuviata* Nuttall), as in *perforans*, indicate that this is a typical pholad-hole form of white *Crepidula* with the same frilled aspect.

Crepidula exuviata Reeve,1859.

The name *exuviata* was first published as a *nomen nudum* in 1839 in Jay's Catalogue, where the species is attributed to Nuttall. Apparently it was not validated until 1859 when Reeve published a description and figure in the Conchologica Iconica. The type locality is given as Monterey and Reeve's figure shows it to be a typical phold-hole form. Thus one can hardly escape the conclusion, based on the descriptions and figures of both species, that *C. exuviata* (Nuttall in Jay,1839) Reeve,1859, is an exact syhonym of *C. explanata* Gould,1853. In addition, the type localities of both are the same/

Crepidula fimbriata Reeve,1859.

This is a laminarly-frilled, flat shell, of roundish shape,"stained with a livid brown ray on one side." The type locality is Vancouver Strait. *Fimbriata* appears to be merely another form of white *Crepidula*, which is common along the coast. Carpenter (1864:565; 1872:51) thought it was an accidentally frilled variety of *navicelloides* , and later (1864:654; 1872; 140) apparently still thought so. Although Reeve's figure (Crepidula pl.2 figs. 110,116), of the specimen may be somewhat exaggerated, its laminated aspect shows it to be closely related or identical with the form found in pholad holes. The major difference seems to be that in this case the shell grew on a more or less unrestricted situs, such a a flat rock or shell. The brown ray mentioned by Reeve is not a distinctive feature as brownish blotches occur on an occasional specimen of the common white Crepidula from any situs where it is found. The " color form" Mrs. Oldroyd figured as C. nivea is one of these (see her plate 93, fig.9).

Crepidula navicelloides Sowerby,1883.

This is another of Nuttall's nomina nuda published first in Jay. Apparently it was not validated until 1883 by Sowerby, who published a description and figure in his Thesaurus Conchyliorum. The type locality is " California". Sowerby's description is too vague to indicate just what of the white forms he had, but his colored figure in plate 453 (Calyptraci-dae, pl.9) fig.143), shows an inside view of a shell that might easily be C. nummaria Gould. This supposition is strengthened further by the slightly yellowish tone around the edge of the figure, as if to indicate the presence of the golden-brown periostracum of nummaria. Furthermore, in the explanation to this plate, Sowerby mentions " osculans C.B. Adams; nummaria and explanata Gld." as if he considered them as synonyms of navicelloides.

Whatever one believes to be the proper allocation of navicelloides, it seems quite obvious that this species name cannot stand as it is preceded by too many others. On the basis of the slim evidence given above, the inclination is to place C. navicelloides (Nuttall in Jay,1839) Sowerby 1883 in synonymy under C. nummaria Gould,1846, rather than in the synonymy of any of the other species mentioned. If this view be accepted, then the figure used by Keep for C. navicelloides in all his editions of West Coast Shells since the earliest in 1881 is not the correct one. It looks more nearly like the common white Crepidula found under rocks along the shores of Monterey Bay and the Monterey Peninsula. It may well be that Professor Keep figured actually the shell that came from this vicinity as he did much of his collecting there.

Crepidula lessonii Broderip,1834.

While this species apparently does not extend in to the Californian fauna it is mentioned because conchologists have assumed that it has a close relationship to some of the other species discussed above- nivea and striolata, for example. In commenting on the species, Broderip states that " it will remind the observer of the upper valves of some of the Chamidae", which gives it quite a different aspect from the other species found in the southern fauna. His colored figures, of which there are four, are inside and outside views of two shells- one a dark phase and the other light. Both have narrow, brown, radiating stripes, and 5 to 7 prominent, rather widely spaced, concentric frills. The brown striping plus the fact that the type locality is the Bay of Guyaquil,Ecuador, quite probably indicate a well marked species, although material is not at hand that answers the description of the species. While other specimens of a flat white Crepidula from the southern fauna have concentric sculpture with a tendency toward a frilled aspect, it is not believed that these are true lessonii.

Crepidula unguiformis Lamarck,1818.

This tongue-shaped white species originally described from North Africa, is reported by Adams and others as having been collected at Panama, Mazatlan, and La Paz. There are no authentic records from California, so far as known, although the suggestion has been made that specimens of this same shape commonly found growing in the apertures of large univalves, such as Natica may be this species. Figures of unguiformis published by Broderip in the Transactions of the Zoological Society of London, and by Tryon in the Manual of Conchology, do not suggest a shell that necessarily grew in a gastropod aperture. Moreover, both figures definitely indicate the presence of a periostracum, which the shells growing in such a situs in California do not have, at least to the writer's experience. Until comparison of the radulas and soft parts of these Crepidulas from both coasts have been carefully compared, the writer prefers to leave the determination of unguiformis as a West Coast species to later consideration and to limit the present consideration to species named from the West Coast.

Crepidula squama Broderip,1834.

According to Broderip, this is a very flat species, the apex of which is " lost in the margin". The type locality is Panama, under stones. The fact that Adams' nivea was also based on specimens collected at Panama is likely the reasonfor considering the two conspecific as both are flat, white species. Broderip's colored figure of the dorsal aspect to squama however, shows a series of narrow, brown, radiating stripes extending from the apex not quite half way down the back and then becoming obsolete. The rest of the shell is whitish. The figure of the interior indicates a well marked ridge about the center of the septum, running longitudinally. The left sinus of the septum edge is U-shaped, like that in nummaria though not as prominent.

As there are young specimens in the Academy's collection that show these characters fairly well, the conclusion is that squama is a good species, different from nivea as this latter species is now understood.

Thus, in allocating our California species of white Crepidula to their proper taxonomic position, we have the following names to deal with: 1. nummaria Gould,1846 2. perforans Valenciennes,1846 3. nivea C.B. Adams, 1852 4. explanata Gould,1853 5. exuviata Reeve,1859 6. fimbriata Reeve, 1859 7. navicelloides Sowerby,1883.

Collecting experience and examination of the material available has brought the writer to the conclusion that there are but three distinct species of common white Crepidula native in California. These are:

1. The large, heavy shell with a golden-brown periostracum.
2. A thinner, flat shell with a thin, papery, light-yellow or almost colorless periostracum.
3. A third species, without periostracum but usually with incrustations, with a fairly coarse and rough shell, extremely variable in size and shape, of which the following three situs forms are common:
   a. The pholad-hole form, generally tongue-shapes, which is frequently frilled at the sides and the apical end.
   b. The smooth, tongue-shaped shell (when adult), found in the apertures of medium or large , dead, gastropods.
   c. A free-growing form, usually rough and heavy with the back incrusted, though sometimes rather thin, smooth and clean. Found on the undersides of large rocks.

Matching these to the list of names leads to the following conclusions on the species of white Crepidulas from California, which are offered here for purposes of further discussion:

1. Crepidula nummaria Gould,1846.
   Type locality: Classet, San Juan Strait, B.C. Present known range: San Juan Strait, B.C. to Magdalena Bay, Lower Calif. Synonym: C. navicelloides Sowerby,1883. This is the species No.1 of the preceding list.
2. Crepidula nivea C.B. Adams,1852/
   Type locality: Panama. Present known range: San Pedro, Calif. to Panama. Synonyms: none assigned, at least from the names applied to white Crepidulas reported from California. This is the species

No. 2 of the preceding list.

2a. Crepidula nivea glottidiarum Dall,1905.
Type locality: San Pedro Bay on the brachiopod Glottidia albida Hinds. Present known range: Santa Monica Bay to San Pedro Bay, California. A situs form of questionable taxonomic standing.

3. Crepidula perforans Valenciennes,1846.
Type locality: unknown but probably West Mexico or Central America. Present known range: Northern Alaska at least to Lower California. Synonyms: C. explanata Gould,1853; C. exuviata Reeve,1859 (= explanata); and C. fimbriata Reeve,1859.

Being the oldest name, perforans has precedence in the allocation of the proper one to cover species No.3 of the preceding list. In the Manual of Conchology (v.8, p. 115), Tryon rejected the name as a " designation representing an untruth" on the basis that Valenciennes thought the animal actually bored the hole in which it lives. However, even though no description was given originally, the name perforans was properly " designated" under the Rules of Nomenclature, as interpreted now, can be applied with reasonable certainty to a well-known form common in collections, and is therefore a valid one. While unfortunate that the name perforans originally was intended for the pholad hole form, there appears to be too much evidence of the extreme variability of this species to warrant the use of more than one name for these shells.

Crepidula adunca Sowerby,1825.

This well-known, distinctive species, with deep-set deck, hooked apex, and brownish color hardly calls for any comment except that a southern California species generally found on Norrisia was thought by some early collectors to be closely related, which is probably true. C. rostriformis Gould,1846, is a synonym of adunca. Its type locality is the Strait of San Juan de Fuca.

Crepidula arenata Broderip,1834.

In the Ashmun Collection, along with a large series of fine specimens of C. norrisiarum Williamson, there is another species of Crepidula that could be immediately separated. Comparison with a large number of arenata in the California Academy and also with specimens in the Stanford Collection prove without doubt that these shells are C. arenata. This adds a new Crepidula to the California list and extends the range of the species to San Pedro (Not La Jolla, as in Minutes, No. 56, p. 14). The entire lot of shells was taken from Norrisia norrisii, and, it might be added, included a few juvenile specimens of C. onyx Sowerby, thus making three species of Crepidula to be found on Norrisia.

In discussing C. norrisiarum (Nautilus, 19:50), Mrs. Williamson mentions a " white porcellanous specimen, shaped like some Crepidula rugosa," and of finding later two live specimens " maculated with chestnut spots". It is therefore possible she had specimens of C. arenata also, a fact that could be checked by someone with access to the Williamson collection. Specimens of arenata from San Pedro are thinner in shell texture than those of norrisiarum, are maculated with brown spots or streaks, and have a rather large, often prominently swollen apex generally depressed to the level of the periphery of the shell. The deck is deep-seated and the apex is excavated internally. Broderip discusses arenata as follows: " This approaches Crepidula porcellana Lam. The septum is somewhat distant from the margin; and the apex, which is also somewhat distant from it, is obtuse, and obliquely turned to the right side." The original specimens were collected in sandy mud, in 6-8 fathoms.

The original figure of arenata is of a much smaller shell than excavata, with a much smaller apex. The dorsal view has two light-colored stripes radiating from the apex, with narrow, interrupted, brown pencillings over the rest of the shell. The inside view shows short, brown stripes at close and fairly regular intervals all around the periphery, with some additional brown streaks in the central area.

Crepidula excavata Broderip,1834.

Examination of the original figures and those given in Reeve's Conchologica Iconica, and in Tryon's Manual raises the question why this name has been associated with a Californian species. The figure is of a large shell with the appearance of a heavy ridge along the back and suggests a species much more nearly related to C. arenata Broderip. The type locality is given as Nicaragua but Dall gives a range north to Monterey. J.G. Cooper apparently was the first to credit this species to California by citing " Crepidula excavata var. jun. Santa Barbara Island" (Cpr. Rept. 1872:98). Johnson and Snook, p. 538, fig. 597 refer to excavata as a thin shell with almost parallel sides, whitish, and mottled with brown except for a white deck. This is certainly not the excavata figured by Broderip and Reeve. Dead shells, similar to the one figured by Johnson and Snook, were picked up on shore at Terminal Island by the writer in 1910 when San Pedro Harbor was being deepened by dredging. Subsequently, similar shells were found in the Ashmun Collection collected at San Pedro, evidently alive, and in the Gordon collection also from San Pedro. One of Ashmun's specimens was in situ on a small round stick of a type not commonly dredged. From this one is led to conclude that these shells and the one figured in Johnson and Snook are a deep water situs form of C. arenata Broderip. Such a conclusion would be an extremely doubtful one were it not for the Ashmun and Gordon material, but under the circumstances there seems to be no other suitable identification.

The California Academy has no specimens that conform exactly to the figure of C. excavata and all records indicate it to be in the Panamanian fauna. Nothing like it has been found at Monterey, so far as known, and consequently Dall's record from there is thought to be based on a misidentification.

It would not be at all surprising to find, when more material comes to hand, that excavata and arenata are conspecific. Specimens of the latter species in the California Academy's collection from Central America suggest an approach to Broderip(s figure of excavata. In commenting on excavata, Broderip said: " This species is remarkable for the depth of the internal margin before it reaches the septum formed by the plate. In Crepidula adunca Sowerby, this depth is even greater than it is in Crepidula excavata. The apex is close to the margin , obliquely turned toward the right side." The dorsal view of the shell shows at least three series of dark spots radiating from the apex on the very early part of the shell only. These end abruptly and the rest of the shell is fawn-colored, without maculations of darker color.

If arenata and excavata are finally determined to be conspecific, as is strongly suspected, the name excavata would undoubtedly take precedence, with arenata as a synonym. Broderip described both species on the same page but excavata was treated first, being species No. 29, while arenata is species No. 30.

Crepidula norrisiarum Williamson,1905.

Early collectors confused this species with C. adunca Sowerby, perhaps with good reason as the two seem closely related. It has also been linked with C. excavata/. This Crepidula is a familiar one to southern Calif-

-ornia collectors, being distinguished largely by its habit of growing on Norrisia and Natica, and by its peculiar magenta-pink color in the interior. All specimens seen lack the brown spots and maculations of areanta, although young specimens have a series of fine, interrupted, light-brown stripes radiating from the apex, which become obsolete when the shell is fully grown. The apex is much smaller than in arenata and is generally dark magenta-pink. Most shells show traces of a thin, light-brown periostracum, which is more evident on young specimens.

The specific rank given this form by Dall in Bull. 112 appears to be correct procedure. It is obviously not related to C. rugosa Nuttall (= C. onyx Sowerby), as originally placed by Mrs. Williamson.

The only specimen of norrisiarum in the writer's collection, other than those from southern California, is an adult shell found growing on a young red abalone at Point Reyes, Marin County, which may not mark the northern limit of range. It would be interesting to know whether the species has been found living in any other situs than on shells.

Crepidula excavata naticarum Williamson,1905.

Mrs. Williamson described this as a white porcellanous shell with brown spots, which leads to the suspicion that C. arenata might be the proper identification unless, on investigation, the type in the Los Angeles Museum turns out to be C. norrisiarum. Specimens labelled naticarum collected by the Burches at Ensenada, in the Estero (Gordon Collection), seem definitely assignable to arenata and not to norrisiarum. In either event the form naticarum would have little taxonomic standing.

Crepidula onyx Sowerby,1825.

C. rugosa Nuttall appears to have been generally accepted as a synonym. The northern end of the range placed at Monterey by Dall, seems doubtful. So far as is known there are no authentic records for this species from this far north.

Crepipatella orbiculata Dall,1919.

This is a rare deep water species dredged in 50 fathoms or more. There appears to be little doubt that it is a Crepipatella.

Crepidula glauca Say,1822.

With the decline of the oyster beds in San Francisco Bay, this species does not appear to be flourishing there. Hemphill collected both dark and light phases at Alameda. More recently, Dr. G.D. Hanna has collected the light phase only living at Rodeo in San Pablo Bay. C. convexa is a situs form according to C.W. Johnson.

Crepidula incurva Broderip,1834.

The San Pedro record seems extremely doubtful. Material in the Californoa Academy collection range from Magdalena Bay to Panama.

Crepidula aculeata Gmelin,1792.

Have seen no authentic specimens from north of Cayucos.

Crepipatella lingulata Gould,1830.

No comment on this common California species is necessary. C. dordata with which it was earlier confused belongs in a more southern fauna and does not come into California. Dorsata appears to be a good species and is not a synonym of lingulata . Specimens in the Academy collection range in locality from Mazatlan to Panama.

In conclusion the writer wishes to acknowledge the help and advice of Dr. Leo G. Hertlein, of the California Academy, in the process of preparing these notes.

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Mr. A.G. Smith, author of the above paper on Crepidula , in his personal letter to the editor makes a few interesting comments that do not appear in the paper. We are taking the liberty of running a few excerpts from this letter. " You will find that I have changed my mind on some points, principal among which is that C. nivea should be limited to a specific shell that I have not seen north of San Pedro and that C. perforans is another species going clear to Alaska in the north and overlapping the range of nivea by extending south along the Gulf and the coast of Lower California. Leo doesn't altogether agree with me on this as he thinks that the characters I have used to separate nivea from perforans may not be enough to make identification certain. He has a real point, I think, but at the same time is unwilling to admit that any of our West American species can actually have a range extending all the way from Alaska to Panama and perhaps farther south. One piece of evidence that I do not have and that I would like to verify is whether the tongue-shaped form found in the apertures of gastropods of Lower California and the Gulf ever have a periostracum. If they do, they are nivea; if not, they are perforans according to my present view. None of my California specimens of this form have it so far as I can see. Then there is the further question whether the hermit crabs might not wear off the extremely thin, papery, colorless periostracum that I now believe is characteristic of nivea. I realize my idea of nivea is not based on too strong evidence, because it has been arrived at by the process of eliminating other possible species names- a sort of reductio ad absurdum.

Having seen your C. naticarum from Ensenada Estero strengthens my supposition that this subspecies is really arenata. I hope you or some one will be able to check the Williamson collection on this point.

On the subject of C. convexa glauca, I note that Johnson in his " Fauna of New England" reverses the names, as Packard did, but speaking of the subspecies convexa he says: " A form due to growing on the shells of Alectrion obsoleta and other very convex surfaces." Gould (Invertebrata of Massachusetts,1941, p. 160) says that Say described convexa from dead shells and " had not seen its true colors". My own opinion would be to throw convexa into the synonymy of glauca, which has page priority in Say's original paper, on the basis that it is merely a special situs color-form of little real taxonomic value."

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Additions and Corrections

In connection with our discussion of the genus Crepidula attention should be called to the extensive and beautifully figured work done in recent years by Dr. Wesley R. Coe, Professor of Biology, Emeritus, Yale University but now associated with the Scripps Institution of Oceanography at La Jolla.

The careful student of this group should certainly study the following publications by Dr. Coe.

Coe, W.R. 1935. Sexual phases in Prosobranch mollusks of the genus Crepidula. Science, 81:570.

Coe, W.R.,1936. Sexual phases in Crepidula. Jour. Exper. Zool., 72:455

Coe, W.R.,1938. Conditions influencing change of sex in mollusks of the genus Crepidula. Jour, Exper. Zool. 77:401.

Coe, W.R.,1938. Sexual phases in the gastropod Crucibulum spinosum. Jour. Morph. 63:345.

Coe, W.R. Influence of association of the sexual phases of gastropods having protandric consecutive sexuality. Biological Bulletin 75:274-285.

Coe, W.R. The reproductive organs of the Prosobranch mollusk Crepidula onyx and their transformation during the change from male to female phase. Jour. Morphology vol. 70, no.3, May,1942.

(con.)

Coe, W.R. Influence of natural and experimental conditions in determining shape of shell and rate of growth in gastropods of the genus Crepidula.

Incidentally it should be mentioned that Dr. Coe has made many very interesting comparisons between the species of both this coast and the Atlantic coast.

The following interesting personal communication is from Dr. W.R. Coe: " If you will refer to Plate 2 of the paper on influence of environment on shape of shell in Crepidula you will note that the largest size of the species nummaria (nivea) at the aperture of the shell of Tegula is only 10-16 mm., while the same species in the shell of Polinices may become more than 30 mm. long and 20 mm. wide or even larger. The same large size is reached under stones and on the sides of piles etc. Associated with these large females or attached to them are one to many small males. You will recall that the young of all species of this and closely related genera are exclusively male, the male changing to the female phase on reaching a certain age, commonly about 4 to 6 months in this region. This species closely resembles C. plana of the Atlantic coast which has corresponding respondes to substrate. The shell becomes wrinkled, instead of smooth, if the animal is frequently disturbed. The yellowish epidermis is usually rubbed off wholly or partially if within a shell occupied by a hermit crab leaving most of the surface pure white."

" I think your notes on this genus are substantially correct."

Attention should be called to the fact that in several of the papers mentioned above Dr. Coe has some beautiful figures of the anatomy or soft parts of a number of the species of Crepidula. These papers should be considered in connection with the previous paper.

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Dr. Joshua L. Baily Jr., San Diego, Calif. " In your last bunch of notes you have quoted a letter from me in which I made a mistake. I said that in my opinion Crepidula norrisiarum looked like a good species, but that Dr. Coe at La Jolla had raised them and disagreed with me. Dr. Coe has written me that he has raised several species of this genus- but that C. norrisiarum is not one of them. Consequently he should not be quoted as expressing an opinion. I depended on my memory when I wrote you, and made a mistake."

Dr. Fritz Haas, Curator of Lower Invertebrates, Chicago Natural History Museum, Roosevelt Road and Field Drive, Chicago 5, Illinois. " In my last letter to you I alluded to the living base on which the Catalina Island specimens of Pediculariella californica were found as a Hydrocorralline belonging to the genus Millepora. Now I find out that, though the animal in question is a Hydrocoralline, its exact name is Allopora californica Verrill.

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Mr. E.P. Chace, 24205 Eshelman Ave., Lomita, Calif. Mr. Chace has given us some further discussion of the Acmaeidae.

" Acmaea- Some comments on Dr. Test's grouping. Plaving instabilis and incessa in different grpups and same for depicta and paleacea, looked odd to most of the club. However, we may be converted when Dr. Test's paper is published and we all have a chance to study it.

A. fenestrata fenestrata- O.K. but personally why give the northern form a separate varietal name because it is always eroded. When we get north next summer I hope to find some fenestrata that are not eroded and also to get a growth series or two.

(con.)

Acmaea paleacea- some of the club say " Not always on the open coast."

Acmaea tessulata- Club somewhat at sea on this section. My idea is that the shells that George Willett collected at Grant Island, Alaska may well be the same as the Atlantic species, but that is the same as the thing from California that we have been calling A. patina or A. scutum is open to question.

A. ochracea Dall- I agree with Mrs. Test's remarks on this species.However, I sent some shells from Topango coast (north of Santa Monica) and she returned one marked A. ochracea. My own idea of this shell is a young light colored A. pelta. Shape, sculpture and apertura all say pelta to me. Another specimen of the species I know as pelta but a dark colored on was returned makked A. asmi. I would liket to see the shells collected from Prince William Sound by Eyerdam stated to be ochracea.

Acmaea triangularis- I believe the Alaska record is probably based on the thing that George Willett collected and called this species but later decided was Dall's parallela. Also ??? did Dr. Test have the living A. triangularis from Monterey or was her work based on the Alaskan shells ?

Acmaea limatula- Believe that the northern records of this are based on misidentifications. We could not find it at Crescent City nor in De Poe Bay collecting. Did you ? (Answer- No.)

Acmaea atrata- Dr. Gregg's specimens are definitely A. conus Test. The Piedros Blancos record is therefore based on a mididentification.

Lottia gigantea- I question the Crescent City record. Northern limit needs verification. Will see what I find next summer.

Mr. Chace sends another correction: " The Littorina newcombiana that we had at the club meeting some time back were from the original lot and not of our collecting as you stated in the Minutes. We hunted for them but did not find them.

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Pleurobranchus chacei Burch,1944. This species was described and figured in the Minutes but no type specimen was selected because it was thought that the species would prove to be conspecific with Pleurobranchus californicus Dall,1900 . However, Mr. and Mrs. E.P. Chace recently discovered some alcoholic specimens in their collection and now the validity of the species can be definitely determined.

Therefore a holotype has been selected and placed in the California Academy of Sciences. A note from Dr. L.G. Hertlein is self explanatory " I think that you are absolutely correct that each species described should be represented by a type specimen even though the name may be completely abandoned. It often happens that the name may be used by later workers and it then becomes very important to have a defimite type for comparison. We are happy to add the specimen to our type collection ...."

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A. Byron Leonard, Department of Zoology, University of Kansas, Lawrence, Kansas. Here is a puzzle for Dr. W.O. Gregg to answer. " For example, since I have encountered many fossil shells of slugs in my study on fossil gastropods, I was very much interested in Dr. Gregg's notes on the Land Slugs of Southern California, with particular reference to the question of whether Deroceras gracile is a native American species or an immigrant from Europe. The problem is certainly a puzzling one because fossil shell plates of the size of the native Deroceras apparently do not occur in this region. This leads us to a dilema, if Deroceras is not a native genus, then it seems necessary to discard the hupothesis that the shell plates I find as fossils represent an ancestral form of the living pppulation of Deroceras."

Professor Ralph W. Dexter, Kent State University, Kent, Ohio. " I believe the name Littorina rudis Donovan 1800 which appears on pages 11 and 37 of issue No. 55 (Dec. 1945) of the Minutes of the Conchological Club of So. Calif. should read Littorina saxatilis Olivi 1792."

David Nicol, Box 2466, Stanford University, Calif. " I have been trying for the past year to get some specimens of Glycymeris with the soft parts preserved. I have asked the U.S. National Museum for specimens, but Dr. Heath has used all of them. Do you or any of the Conchological Club members have any of this material ? Even a cursory examination of the soft parts to ascertain the correct orientation of the shell would be of tremendous value. I will send you reprints of two preliminary papers on the Glycymeridae as soon as I receive them."

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Minutes of the January Meeting o&&the Conchological Club of So. Calif.

The Conchological Club of Southern California met at 7:30 P.M. Jan . 8,1946, a week late, due to the fact that New Year's day fell on the regular meeting date. There were 14 members present, and three visitors all of whom expressed a desire to become members. They were Jim Bailey, 725 W. 115 St.; Arthur D. Howard, 2307 W. 20th St.; and Marshall Sohl Jr., 1433 W. 134th St., all of Los Angeles.

Minutes of the previous meeting approved as printed.

Under communications were a greeting from Mrs. Ora Willett of Kent, Washington, and a letter from Mrs. J.M. Lane, 1475 S. Roosevelt Ave., Pasadena telling of the passing of J.M. Lane on Jan. 1,1945 and her continued illness from which she has only partially recovered and of which the members of the club are sorry to learn. She also spoke of the continued ill health of Mr. Crowhurst and of the robbery of his store at 238 S. Spring St., Los Angeles. While not a member of the club Mr. Crowhurst was always a booster in its behalf, and the secretary is but one of many he has induced to attend the meetings.

Mr. and Mrs. Harrt Turver recently spent some time collecting at Guaymas,Mexico and brought for distribution a very interesting box of duplicates. That they wery rapidly dissapeared is a forgone conclusion.

The prepared lesson was then taken up, the subject being Acmaea, a tough assignment for most of us,and there was considerable discussion, lasting well beyond the hour for closing. The meeting was then adjourned.

Effie M. Clark, Secretary.

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Mr. F.M. Bayer, 1234 Country Club Prado, Coral Gables, Florida. Note Ted's new address. " When I wrote you before my plans were poorly formed. I have come to Gainesville only long enough to resign my position here. I am returning to the University of Miami, and am continuing my schooling accompanied by my companion in collecting over some 10,000 miles of sea and jungles. I will have some interesting news of mollusks when I get a chance to work over our material from the Pacific." We will be very happy if Ted will write a paper on his shell collecting experiences for publication in our minutes.

Mr. Walter J. Eyerdam, 7531 19th Ave., N.E., Seattle 5, Wash. " Mr. H. Harry was over from the navy several times during the holidays and brought out an assortment of marine and land shells which he collected at Tsingtao, N. China, Okinawa, Iso Jima and Palau Islands. There were about 75 species. I classified all except about three of them.

Several weeks ago I received from the University of Uppsala,Sweden, Bengt Hubendick's monograph on the genus Siphonaria in German. It deals very thoroughly with all characteristics of anatomy, evolution and distribution of the species of this family. Very few families of mollusks

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have been dealt with so thoroughly. There is a long summary in English of all salient points in the work. This book should be in the possession of all advanced students working on the anatomy of mollusks."

" Note* - It would be interesting to know the price of this work and all other foreign publications and the name and exact address of the proper person or department to send the order or request.

Mr. Eyerdam also enclosed a few collecting records that arrived too late for publication with the general discussion. They follow:

Hipponix barbata Sowerby- Mazatlan, Mexico,1938.
Calyptraea mammillaris Broderip- Corinto, Nicaragua.
Calyptraea radians Lamarck- Corinto, Nicaragua.
Crepidula nummaria Gould- Corinto, Nicaragua and Gulf of Fonseca,Honduras.
Crepidula onyx Broderip- Corinto, Nicaragua
Polinices uber Valenciennes- Corinto, Nicaragua and Acajutla,Salvador and Gulf of Fonseca, Honduras.
Trivia solandri Gray,1837- Corinto, Nicaragua.

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We feel honored that we have a request for a complete file of our Minutes from the Library of Congress, Washington, D.C. We sent them two copies of our bound work on the Pelecypoda but were not aware that they would care to file all of our papers monthly.

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Hon. R. Winckworth, 71 Whitworth Road, London SE 25, England. We are pleased to have a nice letter, and flattered by the commendation of so eminent a conchologist. We are sorry to learn that Mr. Winckworth has been ill. " I have very much appreciated the interest and excellence of the Minutes of the Conchological Club of Southern California, and would like to be a contributor.. I have sent you separately a copy of my list of the types of the Boltenian genera, which you kindly noticed in the minutes. I will gladly send you copies of any other papers of mine you would like, but few of them have any bearing on California shells. I am chiefly interested in the mollusks of the Indian Ocean, shells and nudibranchs. I had at one time a large collection of British shells, which went to Liverpool Public Museums before the war and was destroyed when Liverpool was bombed in May,1941. Although my house has twice been badly damaged by neighboring bombs, neither my library nor collections have suffered here (apart from some broken Nautilus- which did not matter, as I had already studied them).

I have now retired from the Royal Society though I often go in (when well) as ' Consulting Editor' usually three days a week, but my home address is best."

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Minutes of the Long Beach Shell Club- December,1945

The Long Beach Shell Club had the Christmas meeting with the Ulrich's in Wilmington, and it was a grand time. Twenty four were there, three of them new members and Dr. Wentworth was back with us after a long absence. Mr. Baker called the meeting to order and asked the chairman of the nominating committee to report. The following names for 1946 officers were presented and voted: President, Mr. Baker, Vice-president, Mrs. Libby, Secretary, Miss Eaton.

Reports of collecting trips were to the effect that sea life has changed greatly as to locale during the war, and many old collecting grounds are devoid of material. The complete cause is still not explained.

Next meeting will be held the second Sunday in January, 2:30 P.M. in the library basement. It is about decided to make bo change of time or place for the future if the library can still let us use the basement as in war time.

Mr. Ulrich then entertained the group with his sleight of hand performances, to the delight and mystification of all especially by Ralph Bormann Jr. who was back with us.

After an enjoyable lunch planned by Mrs. Ulrich and her assistant Mrs. Libby , Santa distributed the shell packages and the Ohs and Ahs showed the pleasure of all. A grand host and hostess are Mr. and Mrs. Ulrich and we are happy to have been there.

Next meeting topic will be " Experiences of the December low tides."

Ruth E. Eaton, Secretary.

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Mrs. Wm. B. Smith, P.O. Box 373, Arlington, Texas is interested in purchasing shells.

Flora J. Andrews, 814 N. Vassar Ave., Albuquerque, N.M. wishes to buy shells.

Dr. R.P. Burke, Bell Bldg., Montgomery, Alabama is interested in buying shells.

Mr. and Mrs. E.W. Boerstler, P.O. Box 494, Corona del Mar, Calif. Most of us will envy the Boerstlers their collecting excursion to Mexico. But they exchange and if you have anything good in the line of duplicated perhaps you can still get some of that Mexican material.

Miss Norma Thompson, 1800 Dixon, Des Moines, Iowa inquires about buying shells.

Mr. George W. Bemart, 1144 Whitney Ave., Hamden, Conn. Mr. Bemart has a collection of shells but none from the west coast and asks about either an exchange or a purchase of a series of west coast shells.

W.G. Parris, Boom, Tenn. We have many fine sets of land and freshwater shells from Mr. Parris. He writes that he has had little time for his exchanging during the past year but " I hope to have time to exchange shells with any one who desires specimens of my shells ." Mr. Parris' son Tom is living at 765 Lafayette Ave., Brooklyn, N.Y.

Mr. and Mrs. H.R. Turver, 8640 Evergreen Ave., South Gate, Calif. Another lucky couple making a collecting trip to Mexico. In the past they have brought back several new species and many fine things. No doubt this trip will be as good. They exchange and have rare things to offer.

L.M. Wright, CEM, U.S. Navy, Enterprise, Florida. " You are doing wonderfully well and I herewith tender $2.50 for the 1946 issues which you will grind out in the magic mimeograph. Also when possible I will keep my promise to send the shell club members a box of Blorida marines."

Mr. Charles D. Nelson, R#5 Lake Michigan Drive, Grand Rapids, Mich. " You will find enclosed my check for $2.50 to continue my name on the mailing list to receive your C.C.S.C. Minutes which still sets the pace for any similar publication." Thank you.

Mrs. F.K. Hadley, 14 Vincent St., Box 33, West Newton 65, Mass. All shell collectors should by all means write Mrs. Hadley and ask to be placed on her mailing list. She is a dealer in fine correctly classified specimens . Her new bulletin will be issued immediately. " Thinking you might be interested in seeing what I am doing in the shell line, I am sending you a copy of my new Bulletin which should be out some time next week. It is about ready to go to the mimeographers. I am enjoying the shell business greatly and remember with pleasure our contacts with the Burches, when we were first getting started. It is my intention to get out Bulletins frequently as it stimulates interest in shells."

Mary Mouat, 9 Queens Parade, Davenport, Auckland, New Zealand. " I thank you very much for the notes of your club. You go to a tremendous lot of work to get such details. I am posting a box of shells unnamed of our N.Z. shells for your club. I know so many have these that there would be

PAGE 15 TO 16 MISSING

Family Haliotidae

Genus Haliotis Linnaeus,1758. Type (by subsequent designation, Montfort,1810), Haliotis asinina (Linnaeus).

The only recent contribution to the literature of this genus in our library is Bartsch, Paul, Proc. U.D.N.M., vol. 89, no. 3094, 1940 " The West American Haliotis".

There have been a number of subgenera described but presumably all of our species belong under Haliotis s.s.

Haliotis cracherodii Leach,1814. Coos Bay, Oregon to Santa Rosalia, L.C. Type locality: California.

Our common black abalone is easily recognized by its nearly smooth shell. It could only be confused with H. californiensis Swainson. Grant and Gale state " It seems to favor rocks not thickly covered with algae and is supposed to subsist on diatoms."

A number of subspecies have beend escribed. H. cracherodii splendidula Williamson,1892 (Proc. U.S.N.M., vol. 15, p. 198) isa color form from Point Vicente stated to have brilliant blotches of color in the interior. Dr. Bartsch places this in the synonymy with approval of the majority.

The imperforate shells have been given several names, the best known perhaps being H. cracherodii holzneri Hemphill,1907, which seems to be without much doubt the same t hing as H. cracherodii imperforata Dall,1919. We have collected these shells on numerous occasions and in our opinion theya re simply abnormal individuals and the names have no significance. But if they do, why the same abnormality in other species has not been named I do not know. Imperforate specimens of Haliotis fulgens are perhaps even less rare. The last perfect specimen of an imperforate H. fulgens coming into our hands was from Malaga Cove, L.A. Co. It is now in the collection of Mrs. Hattie Gemmell of San Jose, Calif. We attach no significance to the form. Therefore the article by Dr. G. Dallas Hanna in Nautilus 41:35 in which he discusses Haliotis cracherodii lusus Finlay (Trans. New Zealand Institute, vol. 57, 1926, p. 492) (new name for H. c. imperforata Dall- preoccupied) is of little interest in my opinion other than perhaps adjusting the synonymy.

Collecting data: The most abundant littoral species collected in any numbers desired from Monterey, Cayucos, Morro, Malaga Cove, Point Vicente, Point Firmin, Laguna, Punta Banda, L.C. (Burch).: P.M. Connolly brought back specimens from San Quintin Bay, L.C., Mexico: Half Moon Bay, Calif. (Emery); Magdalena Bay, L.C. (Hemphill); Santa Rosa Island (Fleming); San Clementeand San Nicholoas Islands (Lowe); Coronados Islands (Stephens)

Haliotis cracherodii californiensis Swainson,1822. On the islands; the Farallones to Guadalupe Island. Type locality: California.

This species resembles H. cracherodii Leach in every respect other that that it has from 12 to 16 small perforations usually almost flush with the surface of the shell. Most of us have been disposed to consider this a distinct species, but Dr. Bartsch in the paper cited above reduces it to a subspecies stating " for the organisms on Cerros and San Bonita Islands form perfect intergrades between the typical H. cracherodii and H. californiensis ..."

A subspecies of this form was described by Orcutt, Haliotis californiensis bonita Orcutt, 1900. This is another abnormaility in that some individuals have a supplementary shell deposit in the interior. The same thing occurs occasionally in other species, and the general opinion is that it is of no significance. Dr. Bartsch discusses it on p. 57.

Collecting data: The only specimens in our collection came from Guadalupe Island collected by the late Dr. Fred Baker (Burch); there are specimens in the Lowe collection in the San Diego Museum so labelled from Todos Santos Bay and also San Pedro. Both the Lowe and Baker collections have specimens also labelled with the name bonita mentioned above.

Haliotis rufescens Swainson,1822. Point St. George (Thompson) and Crescent City, Calif. (Chace) south to La Paz, L.C. and the Galapagos Islands. Type locality: Galapagos and California.

Dr. Bartsch gives the range Mendocino County south to Catalina Island. However, I have personally collected it from the coast south of Todos Santos Bay, L.C.

Our most common commercial species is well known by its brick red color, large size, light spiral sculpture and radiating waves. Grant and Gale make an interesting note " Curtner determined that California specimens six inches in diameter were 9 years old, those 8 inches in diameter 13 years old."

Collecting data: The common food species brought into Monterey and Morro Bay canneries and packing plants. It is probable that a good many questionable localities have been placed on the record from specimens collected from the backs of these shells. I forget who it was that collected over 50 species from the back of one large H. rufescens, I do not doubt it. Small species of almost every group seem to come up on these, sponge covered with Cerithiopsis, Tylodina etc. and the algae attached to them offers a nestling spot for countless others. However, these shells are collected by the commercial divers far up and down the coast and brought back into Monterey fromas far south as Santa Barbara. Therefore, the exact locality from which they came is subject to a variation of several hundred mailes.

We have collected them from Punta Banda, L.C. and the coast around the point. P.M. Connolly brought back specimens of the species from far down the coast on his trip to San Quintin Bay. The exact southern end of the range is a question (Burch); Mr. E.P. Chace reports " variable in all directions. Have 3 dimehtion measurements of 30 specimens "; Fort Bragg Calif. (Hemphill) south to San Quintin Bay (Sternberg); Point Loma west side (Creelman); San Miguel Island, kitchen middens (Hemphill); San Nicholas Island, kitchen middens (Lowe) (San Diego Museum).

Haliotis rufescens walallensis Stearns,1900. De Poe Bay, Oregon (Burch) south to Mendocino Co., Calif. Type locality: Gualala,Mendocino Co.,Cal.

It has been the general opinion that this is a good distinct species. However, Dr. Bartsch considers it a northern race of rufescens. " Its narrower shape, less rugose surface, and smaller size differentiate it from the typical race."

Anchor Bay, Mendocino Co. (Chace). Mr. E.P. Chace comments on this species " I believe that this is a good species. If not I would place it as a variety of fulgens. The edges of the animal are not smooth and blackas in rufescens but blotched in 2 shades of olive and with a pustulose surface."

Haliotis rufescens hattorii Bartsch,1940. Santa Barbara to Todos Santos Bay (Burch). Type locality: near Santa Barbara.

Collecting data: We collected specimens that seem to fit Dr. Bartsch's description in Lower California. This subspecies must be very close to the typical.

The original description follows: Proc. U.S.N.M., vol. 89, no. 3094, 1940, page 52, pl. 8, figs. 4-6.

" Shell small, oval, rather flat, spire depressed, with a slight auricle where the outer lip joins the preceding whorl at the summit. The color of the first half of the shell is blue, slightly variegated with red. The last half is banded with zones of red and bluish white. The sculpture consists of irregular lines of growth and indications of axial waving. The spiral sculpture consists of low, flattened threads, which are not quite so wide as the spaces that separate them. These, in combination with the incremental lines, give the ssurface a somewhat clothlike texture. The siphonal angle bears moderately elevated craters, the last four of which are open. Between the siphonal line and the edge of the aperture the shell is rounded and marked like the surface posterior to the siphonal line. The entire outer surface has a waxy appearance. The interior is pearl-gray with irridescent tints, the outer edge of the outer lip being pale reddish. The right edge of the aperture is slightly crenulated; the left edge is rather broadly expanded and flattened, sloping outward, the shelf being about the same width on the parietal wall. Muscle scar poorly differentiated.

The type, U.S.N.M. No. 535761, was collected by Mr. Hattori, an abalone diver, near Santa Barbara, for which I take pleasure in naming the form. When placed on the aperture it yields the following measurements: Height, 18 mm; greater diameter, 100 mm; lesser diameter, 74 mm .

This subspecies can be differentiated easily from typical *Haliotis rufescens* Swainson by its very flat shape, the very poorly elevated spiral threads, the wavy surface, and by lacking the elevated tumid area between the siphonal line and the edge of the aperture. From *H. rufescens walallensis* it is easily distinguished by its much broader shape and feebler sculpture. "

Haliotis ponderosa C.B. Adams,1848. Amer. Jour. Sci. and Arts, ser. 2, vol. 6, pp. 138-139.

This name has been very generally placed in the synonymy of *Haliotis rufescens* on the theory that the description seems to call for an exceptionally large specimen of *rufescens*. However, Dr. Bartsch seems to have examined the type located at Amherst College and considers it a good species. But both the locality from which it came and the possible range is unknown.

Dr. Bartsch in the paper cited above redescribed the species as follows: " Shell large, very heavy, strongly inflated, spire well elevated. The exterior is brownish red, rough, and somewhat worn. It shows irregularly developed and distributed , weakly irregularly nodulose axial ridges and very rough incremental lines, as well as indications of spiral cords. Anterior to the line of siphonal craters, the last four of which are open, the shell is moderately elevated and strongly rounded. On the early part of the last turn it has a broad, feebly developed, median tumid ridge. The dextral and parietal walls of the aperture are broadly expanded, sloping slightly inward, but not excavated.

Interior irridescent with pearly gray tint prevailing. Muscle scar large, rugose-granulose.

The type, deposited at Amherst College, yields the following measurements: Greater length, 215 mm; greater diameter, 167 mm.; height 80 mm; weight, 965 grams.

The shell appears related to Haliotis rufescens, from which the ponderous shell, well-elevated spire, and pale interior (H. rufescens has the lively irridescent-green color scheme) readily differentiate it.

It is to be regretted that Professor Adams was unable to give any information about the habitat of this abalone. I believe that it should be looked for in southern California on extremely exposed and surf beaten ledges."

Haliotis fulgens Philippi, 1845. (H. splendens Reeve, H. planilirata Reeve) Farallones Islands to the Gulf of Calif. Type locality: Not given.

Grant and Gale state " distinguished by its spiral sculpture, moderate convexity, angle at the row of holes, and keel." This is our common " blue" or " green" abalone.

Dr. Bartsch described a subspecies of ffulgens from Magdalena Bay Lower Calif.- H. fulgens turveri Bartsch, 1942 (Nautilus, Oct. 1942).

Collecting data: Our experience has been to find this a southern species from Santa Monica, Calif. becoming increasingly common in Lower California until it is seen in great numbers below Todos Santos Bay (Burch) Piedras Blancas Light House (Orcutt); Magdalena Bay (Cass); Cedros, Ascencion, San Roque Islands (Huey); Coronado Islands (Stephens) (San Diego Museum).

Haliotis corrugata Gray, 1828. Monterey, Calif. south to San Quintin Bay, L.C. Type locality: California.

Grant and Gale state " easily distinguished by its outline and convexity, its rough surface, and tubular perforations ". This is the common named " pink" abalone.

A variety of H. corrugate, probably of doubtful validity, was described by Orcutt, Nautilus , vol. 33, p. 62, 1919- H. c. diegoensis, differing from the typical form by lacking corrugations. Type locality, La Jolla.

Mr. E.P. Chace calls attention to the fact that young specimens are very flat

Collecting data: Our experience has been to find this a southern species very common along the Palos Verdes Hills and abundant around Todos Santos Bay. P.M. Connolly brought back specimens from San Quintin Bay, L.C. No doubt the southern end of the range is still farther south. (Burch); San Pedro (Lowe) to San Quintin, L.C. (Sternberg) (San Diego M.

Haliotis kamtschatkana Jonas, 1845. Kamchatka Sea (Midd.), Sitka, Alaska to Redondo Beach, Calif. and Japan. Dr. A. Myra Keen advises " The type locality is " near Unalaska, Kamchatka Sea."."

Collecting data: Ketchikan, Alaska and Metlakatka, Alaska (G. Willett); from divers 10 miles off Yankee Point, 10 miles south of Pacific Grove (A. Sorensen); Monterey, Calif. (Lowe); Kii, Japan (coll. by S. Kinoshita); Whale Bay, Baranoff Island, Ketchikan and Craig, Pr. of Wales Island, S.E. Alaska (W.J. Eyerdam).

Haliotis aulaea Bartsch,1940. Proc. U.S.N.M. vol. 89, no. 3094, p. 53, pl. 8, figs. 1-3. Type locality: 8 to 10 fms. off Cayucos, Calif.

Range: Monterey, Calif. south to Port San Luis Obispo.

It is probable that some of the Montereyand other southern records for H. kamtschatkana are of this species. The resemblance is close.

The original description follows: " Shell of medium size and rather low, spire slightly elevated. The color scheme of the exterior is a mixture of greenand red, more or less disposed in interrupted spiral zones, producing a tapestry-like effect. Interior pearl-gray, edge of peristome variegated chiefly with green. The exterior is marked by numerous flattened spiral cords,which vary materially in size, usually finer ones separating the broad elements. In addition there are obliquely protractively, radiating nodulose ridges, the nodules being depressed. The surface likewise has numerous incremental threads, which render the finer cords minutely nodulose and the rest lirate. The siphonal angle bears numerous craterlike projections, the last six of which are open. Anterior to the siphonal angle there is a rather strong spiral cord midway between this ridge and the basal edge of the shell. This part of the shell is also marked by spiral cords, a little finer than those on the spire, and by the continuation of the incremental elements. The aperture is broadly oval, the outer edge of the peristome is acute,while the posterior portion of the inner lip slopes materially inward. The surface of the inside is wavy and its color pearl-gray.

The type, U.S.N.M., No. 535848, was collected by A. Sorensen in 8 to 10 fms. off Cayucos, Calif. It measures: Height, 34 mm.; greater diameter, 110 mm.; lesser diameter, 85 mm.

U.S.N.M. No. 535849 contains four additional specimens, which range from a length of 53 m . to almost the size of the type. These came from 10 to 15 fms. off the southern part of Monterey County, Calif. Two others, U.S.N.M. No. 535850, came from off Port San Luis Obispo.

This species suggests slightly Haliotis kamtschatkana but is much broader than that. It reminds one also of H. assimilis, but its coarse sculpture at once removes it from that association."

Haliotis smithsoni Bartsch,1940. Proc. U.S.N.M. vol. 89, no. 3094, pp 54-55 pl.8, figs. 7-9. Type locality: Catalina Island. Range: Santa Cruz Island to San Diego.

The original description follows: " Shell large, with a strongly mqmmillated spire, whose whorls are separated by a rather deeply impressed suture. From the summit to the row of siphonal apertures the whorls are almost straight, a little convex on the last portion of the last turn. The siphonal openings are craterlike, the last three or four being open. The sculpture between the summit of the whorl and the siphonal line consists of coarse incremental lines thatdevelop into inconspicuous, low, rounded reqges, which are almost regular in distribution; these ridges bear obsolete, ill-defined nodules. In addition there are slender spiral threads, which are of varying width and differ slightly in spacing. Between the siphonal line and the edge of the aperture there is a low, raised keel a little posterior to the median line. The space between this rounded keel and the siphonal line is slightly concave and marked by incrmental lines and spiral threads. Anterior to this submedian line the shell is slightly rounded and marked by the continuation of the rugose radial threads referred to for the spire and spiral threads. The aperture is oval and is sharp on the dextral margin, while the left margin is moderately broad and slopingly excavated. This slope extends over the parietal wall, where it is a little broader. The muscle scar is rather pronounced. The color schme of the interior is pearly gray with irridescent, prismatic, scattered flashes. The type, U.S.N.M. No. 60425, comes from Catalina Island Placed flat onthe aperture it measures: Height, 57 mm.; greater diameter 140 mm.; lesser diameter, 107 mm. There are two additional specimens in our collection, one of which, a little smaller than the type, USNM No. 98329, collected by Dr. Cooper at Santa Cruz Island, measures: Height, 50 mm. greater diameter 119 mm.; lesser diameter, 94 mm. The other, USNM No. 11868 a very large specimen, bears the locality label San Diego, which I somewhat question. This measures: Height, 77 mm.; greater diameter, 193 mm.; lesser diameter, 148 mm. This species suggests Haliotis kamtschatkand. Its gigantic size and comparatively feebler sculpture will readily distinguish it from that. I take pleasure in naming it for the founder of the Smithsonian Institution, James Smithson."

Haliotis assimilis Dall,1878. Farallones Islands to San Diego, Calif. in deep water. Type locality: California.

A strongly inflated oval species.

Collecting data: We have dredged numbers of specimens of what we identify as this species' from off Redondo Beach usually in 25 fathoms or slightly deeper. The same thing from off El Segundo in 35 fms. We brought up one lot from about 50 fms. on the north side of the submarine canyon off Redondo. There is some question in my mind thought whether or not these are identical with the large shells we have identified as this species from off Monterey. (Burch); by diver from 10 fms. off Yankee Point, 10 miles south of Pacific Grove (A. Sorensen); Pt. Conception, Calif. (Lowe); Redondo from 50 fms. (Lowe); San Diego (Gripp); Coronado (Orcutt) (San Diego Museum).

Haliotis sorenseni Bartsch,1940. Proc. U.S.N.M. vol. 89, no. 3094, p. 53, pl. 8, figs. 1-3. Type locality, south of Point Conception,Calif. in 10 fathoms.

Range: Point Conception, Calif. south to West Mexico.

Collecting data: Many os us had this large species in our collections labelled H. assimilis before Dr. Bartsch described it. It is my opinion that it is a good species but in outward appearance it is very close to H. assimilis. The late Dr. Fred Baker had numbers of fine specimens from Lower California. We brought up one fine specimen from about 6 fathoms off Malaga Cove, L.A. Co. Mr. H. Ralph, since deceased was the diver. One amusing thing occured with this species. After the description of H. sorenseni there was quite a demand for it by the local collectors and members of the club. Mr. Naylor of San Diego who imported abalone shell for commercial purposes had several burlaped bales of this species imported from Mexico along with large numbers of fulgens, but finding the shells of sorenseni too thin to polish for souvenirs he sold the lot to a mill to grind them up into gravel for chicken feed. We could have done much better selling the shells had he known what he had. (Burch); San Martin Island ('cass); Cedros Island (Naylor).

The original description follows: " Shell large, thin, the exterior brownish red, decidedly inflated, spire well elevated. Between the line of strongly elevated craterlike siphonal perforations, of which the last four or five are open, and the edge of the shell the upper three-fourths is gently rounded, while the outer quarter flares to a considerable expansion, which produces a decided, concave line at the inner edge of the outer fourth of this part of the shell. The outer surface is marked by more or less regular, broad, low, axial ridges, which bear irregularly developed, not strongly pronounced, nodules. The outside is further provided with numerous closely placed, slender, spiral cords that vary materially in strength and with numerous closely spaced, incremental lines that almost equal the spiral cords in strength. In addition to this sculpture, broad, low, elevated, axial areas, which are feebly nodulose, alternate with depressed zones. The interior of the shell is irridescent with a pinkish pearly hue prevailing, and bright rosy tints mark the outer half, while within, scattered greenish areas of irregular size and distribution are present. The muscle scar, usually strongly marked in Haliotis, is here but feebly impressed, in which character it resembles the other California deep-water species, Haliotis assimilis. It resembles that form also in the excavated inward sloping of the expanded dextral margin of the aperture and the sealing-wax colored edging of the peristome, but differs materially in size and in the color of the interior.

The type, USNM No. 535688, resting upon the aperture, yields the following measurements: Greater length, 218 mm.; greater diameter, 168 mm; height, 81 mm. It weighs 448 grams.

Two paratypes in Mr. Sorensen's collection yield the following measurements, respectively: Greater length, 300, 210 mm.; grater diameter 149, 172 mm.; greater height, 79, 65 mm.; weight, 370, 465 grams. Of these specimens Mr. Sorensen writes: " They were found slightly south of Point Conception, Calif. by a commercial abalone diver, in 10 fathoms depth. After one was found dilligent search for two weeks succeeded in finding only three more. No other diver found any; the time was about September, 1939." A subsequent letter states: " The animal was colored yellowish with dark specks, and the meat was quite tender."

Family Fissurellidae

We have no references to papers on this family from the West Coast but, the Atlantic species have been very thoroughly worked by Isabel Perez Farfante in Johnsonia #10, August,1943 and continued in Johnsonia #18, 1945.

Genus Fissurella Lamarck,1799. Type (by monotypy), Fissurella nimbosa Linne,1758.

" Shell conical, elevated, depressed and even flattened, variable in size, with the apex subcentral. Orifice at the summit or anterior to it, variable in shape. Surface in a few species smooth, in others with shallow grooves, but generally with numerous radiating ribs which frequently possess small or large nodules or erect scales. Concentric growthlines are always more or less visible. Margin simple, crenulated or notched. Muscle impression continuous but formed as two parts, the larger horshoe-shaped with the extremities enlarged and connected by a smaller and narrower band or scar. The orifice is bounded inside by a callus which is not truncated or excavated. Shell wholly external, capable of containing the soft parts." Johnsonia #10, pp. 1-2.

Subgenus Balboaina Perez Farfante,1943. Type (by original designation) Fissurella picta Gmelin.

" Shell generally large, certain species reaching a length of 100 mm.

(con.)

heavy and broadly conical. Orifice a little in front of the middle. Outer surface smooth, with numerous radiating striae or ribs more or less nodulose. Margin of the shell entirely in one plane, simple not crenulated and with a dark and generally broad, interior border. Internal callus of the orifice usually broad." Johnsonia #10, p. 2, 1943.

Fissurella virescens Sowerby,1835. Proc. Zool. Soc. for 1834, pt. 11, p. 125. San Pedro, California to Peru.

Mr. A.M. Strong advises that there is a good record of this species from San Pedro by Dr. Tremper.

Dr. A. Myra Keen sends a copy of the original description which follows: " Fiss. testa ovata, elevatiuscula, radiatim costata et striata; intus virescente, margine pallidiore, undulato et crenulato; extus pallide virescente fusco-virescente obscure radiata, margine costellis crenato; apertura dorsali oblonga, extus utrinque coarctata: long. 1.8, let. 1.4 poll. Hab. as Panamam. Found in exposed situations at low water."

Collecting data: Tres Marias Islands, Mexico(Lowe); Galapagos Islands (Calif. Acad. Sci.); Mazatlan (Forrer) (Lowe); San Juan del Sur, Nicaragua (Lowe).

Fissurella volcano Reeve,1849. Crescent City, Calif. to Panama. Type locality: Santa Barbara, Calif.

Collecting data: One of our common species to be found on almost any rocky rubble the length of the California coast and on down the coast to the south. There are some odd races of this species and it is a wonder more of them have not been named. There is a large colony on the San Pedro breakwater distinguished by what seems to be corrosion on the inside of the shells. Specimens from Cayucos, San Luis Obispo Co. seem to be both of exceptional size and oddly shaped.

A subspecies Fissurella volcano crufifera Dall,1908 is a color form with radial white bands. The general opinion is that this is of no significance whatever. Color patterns in this species could be given a list of names too long to find names for them.

Genus Megathura Pilsbry,1890 Type (by monotypy), Megathura californica Nuttall MS * Megathura crenulata (Sowerby).

Our species of this genus has been placed under the following generic names: Lucapina Gray,1857 by Tryon, Arnold and early Keep. Macrochasma Dall,1915. It is strange that Grant and Gale did not even mention or discuss Dr. Dall's lengthy discussion in his paper in 1915 " On some Generic Names mentioned in the " Conchological Illustrations". But it is also odd that Dr. Dall made no mention of Pilsbry's Megathura 1890 when he proposed the name Macrochasma Dall,1915.

Megathura crenulata (Sowerby),1825. Monterey Bay, Calif. to Cedros Island, L.C. Type locality: not given.

Collecting data: This large species with the shell almost internal and far too small for the animal is amazingly common at seasons. It has been called Chinese abalone but I wonder how they could eat them. We tried it once and found them somewhat tougher than shoe leather. Certain localities seem to abound with this species. The Santa Monica breakwater usually will produce as many as you care to toss in your row boat but this is perhaps because this breakwater is only reached by water and therefore protected from the host of beach collectors. Also common at San Pedro, San Onofre, Balboa etc. (Burch).San Geronimo Island, L.C. (Lowe).

Genus Lucapinella Pilsbry,1890. Type (by original designation), Clypidella callomarginata Carpenter.
" Shell depressed conical, rather small, with the apex subcentral and completely occupied by the large orifice. The shell is sculptured with irregular radial ribs, crossed by laminae which form small scales. Margin thickened, so much so that in adult specimens the crenulations are blunted. In general it rests on a plane but sometimes its posterior end is slightly raided. Internal callus of the orifice narrow, its posterior extremity roundly truncated. Muscle impression of a uniformly narrow width." Johnsonia 10:18-19.

Lucapinella callomarginata(Dall)1871. Bodega Bay, Calif. south to San Juan del Sur, Nicaragua (Lowe). Type locality: not given.
Collecting data: The animal is far too large to be contained in the shell which is almost internal. Our experience has been to find this species comparatively rare with localities from Monterey, Cayucos, Morro, Newport Bay, Bird Rock, Mission Bay, Punta Banda, Arbolitos,L.C. (Burch); Anaheim Bay in the old oyster beds (Chace); Alamitos Bay (Lowe); Anaheim Bay (Lowe); San Diego, Calif. (Hemphill); Mission Bay (Lowe); San Jauan del Sur, Nicaragua)(Lowe).

Genus Megatebennus Pilsbry,1890. Type (by original designation), Fissurellidea bimaculata Dall.
" Edges of shell elevated at each end, blunt at the sides, in adults not crenulated." (Pilsbry). Grant and Gale state " Lucapina Gray differs in that the edges of the shell are nearly in a plane, are finely crenulated and are not elevated at the ends."

Megatebennus bimaculatus (Dall),1871. Forrester Island, Alaska to Tres Marias Islands, Mexico (Strong and Hanna). Type locality: Dr. A.M. Keen advises " Not selected; by implication, Monterey, Calif.
Collecting data: One of the interesting things about this species is the variation in the color of the animals. We took them in large numbers at Cayucos, San Luis Obispo Co. and found that we had three entirely different colored animals, deep red, deep yellow and white. Study of the animals at the university showed absolutely no difference other than the color, and of course, the shells were identical. This experience has caused me to place a little less emphasis on the color of the animals of some of the species. This is a littoral or shallow water species. It is common under stones the length of the coast, but our deepest dredging records show 15 fms. off both Montereyand Redondo Beach, Calif. (Burch); Crescent City, Calif. (Chace) to La Jolla (Bristol) (San Diego Museum).

Genus Diodora Gray,1821. Type (by monotypy), Patella apertura Montagu = (Diodora graeca Linne).
This generic name is frequently incorrectly spelled Diadora instead of Diodora.
" Shell conical, elevated or depressed, the size varying between wide limits. Apex in front of the shell center: in young specimens curved and slightly twisted, inclined backward and with a fissure in fron of it. In the adult, this small and slightly twisted portion is totally lacking. Orifice at the summit or immediately anterior to it, variable in shape. Surface of the shell sculptured by conspicuous radiating ribs and concentric

threads or laminae. Basal margin of the shell resting upon a plane or slightly elevated in the middle part of the sides; never raised at the ends. Margin strongly crenulated. Muscle impression frequently indistinct, but when distinct, not uniform in width and with the anterior part incurved at the ends. A few species have the muscle scar completely oval and of a uniform width. A small and narrow connecting ridge bridges the area between the incurved ends. The orifice is bounded by a callus which is truncated posteriorly and sometimes excavated at this region forming a deep pit. Shell completely external, not covered by the mantle and capable of containing all of the soft parts." Johnsonia 11:1.

/ San Juan del Sur,Nicaragua(Lowe)

Diodora aspera (Eschscholtz),1833. Cook(s Inlet, Alaska to Magdalena Bay, L.C. Type locality: Dr. A.M. Keen advises is "Norfolksund bei Sitka."

Perhaps the most common agrument in connection with this species is the subspecies denisclathrata (Reeve),1850. Grantand Gale,1931, p. 850 place the subspecies denisclathrata in the synonymy of the typical. However this is by no means accepted by all. I have personally never seen a specimen so labelled nor have I recognized a specimen of this variety. It is described as having subequal, nodulous ribs, and theseare characters I have never seen on a specimen of aspera. The range is given by Dall as Monterey south to San Quintin Bay and Socorro Island. An interesting item is that the San Diego Museum of Natural History have numerous sets in the Lowe collection labelled D. aspera denisclathrara Rve. as follows: La Jolla (Galloway); San Pedro; Mission Bay; Guaymas,Sonora; Mazatlan; Cape San Lucas; Manzanillo; San Juan del Sur, Nicaragua (Lowe). In any event the Nicaragua record is an extension of range southward. Dr. W.O. Gregg states " I consider denisclathrata a synonym of D. aspera." The consensus of opinion seems to be that denisclathrata is either a subspecies of questionable validity or a synonym.

Collecting data: In our experience this is a comparatively common species littoral in about the same habitat as Fissurella in the northern part of the range but more common if not confined to deeper water in the south. It is easily found exposed on stones from Puget Sound south to Cayucos in our experience- from Crecent City,Monterey,Cayucos, littoral. We found it a shallow water species in the dredgings off Monterey not deeper than 15 fms. or perhaps 20 fms. at most. This bathymetric range seems to be fairly constant southward to Todos Santos Bay, L.C. where we dredged it in 15 fms. It was rather common on kelp holdfasts washed ashore in southern California from Los Angeles to San Diego, Imperial Beach etc. Not uncommon in the Pleistocene of Timm's Point, San Pedro. (Burch); " In march,1922, I found a nice set of Diodora aspera on the breakwater at Fish Harbor, San Pedro." (W.O. Gregg).

/ to Tres Marias (Srearns).

Diodora murina Arnold,1903. Crescent City, Calif. south to Magdalena Bay, L.C. Type locality: not known.

Dr. A. Myra Keen comments on this species as follows: " There is a real problem in connection with this name. The first usage is clearly a nomen nudum (Dall, Proc. U.S.N.M. vol. 8, 1885, p. 543) "Fissurella (Glyphis) murina Cpr. Not common. San Diego. This is the Glyphis denisclathrata of Californian conchologists, and for a time of Carpenter but not of Reeve." Incidentally, Grant and Gale cite this reference as " Carpenter in Dall in Orcutt." But however one cites it it still is a nomen nudum. Article 25 of the International Rules requires for a species an indivation, a definition, or a description. Obviously the latter two are lacking, and an indication is defined in Opinion 1 as: a bibliographic reference , or a published figure, or a definite citation of an earlier name for which a new name is proposed. Dall's usage does not conform to any of these since he ~~says~~ in effect cites only misidentified specimens. The later citation copied by Mrs. Oldroyd is no better. So far as I can find , the first valid usage is by Arnold,1903 (Mem. Calif. Acad. Sci., vol. 3, p. 339), where there is a brief description. The first figure of the species would be also by Arnold, Proc. U.S. Nat. Mus. vol. 32, pl. 50, fig. 3,3a, the specimen being a fossil probably of Pleistocene age. Until someone selects a lectotype from among Arnold's material, most of which is here at Stanford, the type locality of this species* is undetermined. If the Williamson collection is extant, one could select one of the Catalina specimens,as Arnold cites that record,"

Collecting data: Our experience has been to find this species not littoral but confined to comparatively shallow water. We dredged it in 20 fms. off Monterey in considerable humbers ; 15 fms. off Pacific Grove 35 fms. off El Segundo; 25 fms. off Redondo Beach; 25 fms. off Avalon, Catalina Island; and occasiohally taken rom kelp holdfasts from Los Angeles to San Diego county. (Burch); San Diego (Hemphill); La Jolla and Long Beach and San Nicholas Island (Lowe) (San Diego Museum)

* Additional data for Diodora aspera Eschscholtz- by W.J. Eyerdam
" San Juan Islands, Port Orchard, Kitsap Co., Rosario Beach, Skagit Co., Challam Bay, Challam Co., Wash.; Port Armstrong, Baranof Island, S.E. Alaska. About 2 dozen specimens were collected on underside of stones at Rosario Beach. Each one of them had a polynoid commensal worm called Halosydna lordi Baird nestling under the mantle."

Diodora inaequalis (Sowerby),1835. ??? Santa Barbara, Calif. south to Mantua, Ecuador and the Galapagos Islands. Dr. A. Myra Keen advises " The type loc. of D. inaequalis is " Guacomayo and Galapagos Islands. ."

This species is questionably a member of the California fauna. We have it from many localities down the west coast of Mexico, Guaymas, Punta Penasco etc. The only specimens reported from California are from the San Diego Museum by Miss Bristol " From many points from Lower Calif, to Panama- 2 specimens from Imperial Beach, Calif. found by Mrs. Kate Stephens."

Genus Puncturella Lowe,1827. Type (by original designation) (fide Woodring), Patella noachina Linnaeus.

A number of subgenera have been described. Grant and Gale state " In the typical section of Puncturella the apex is not absorbed by the perforation. In Section Fissurisepta Sequenza the apex is absorbed by the anal perforation. In Section Cranopsis Adams , the fissure is on the front slope instead of at the summit."

Puncturella major Dall,1891. Pribilof Islands, Bering Sea and southward to Dixon Entrance, Alaska. (Dall). south to San Juan Islands, Puget Sound (Eyerdam). Type locality, Albatross Station 3262, off coast of Akutan Island, Bering Sea in 43 fathoms.

Puncturella galeata (Gould),1848. Unalaska, Aleutian Islands, south to Redondo Beach, Calif. (Burch) . Type locality: Dr. A.M. Keen advises " The type locality of Puncturella galeata is Oregon according to the holotype label."

Collecting data: Dredged off Redondo Beach, Calif. in 50 fms.; off El Segundo, 5 mi, N. in 35 fms. (Burch); Drier Bay, Knight Island in 10 fms. mud; Izhut Bay, Afognak Island; Raspberry Island, Alaska- dredged (by W.J. Eyerdam); Hinchinbrook Island, Alaska (Norberg) (Eyerdam); San Juan Islands, Puget Sound (Oldroyd); Drier Bay, Knight Island, Alaska from 20 fms. (Brown) (San Diego Museum).

Puncturella eyerdami Dall,1924. Naurilus, vol. 37:133 (not figured). Range: Drier Bay, Knight Island, Pr. Wm. Sound, Alaska.

Collecting data: Collected by W.J. Eyerdam in 1923, in mud bottom, in 25 fathoms.

Puncturella cucullata (Gould),1848. Kodiak Island, Alaska to La Paz, L.C. Type locality: Puget Sound.

Dr. Kenn advises that the correct date of these Gould descriptions is 1848 instead of 1846as given in Bull. 112 and other works.

Grant and Gale state: " Puncturella cucullata (Gould) has sixteen prominent widely spaced, primary radiating ribs with subdued secondary ribs between. In Puncturella multistriata Dall the middle one of these secondary ribs is emphasized, giving the sculptural aspect of the shell a very different appearance. In Puncturella major Dall these middle secondary ribs are as strong as the primaries, giving the shell twice as many primary radiating ribs as cucullata. Mr. George Willett, of the Los Angeles Museum staff, has a series of Recent specimens of this species but they do not seem to intergrade and he is of the opinion that they are distinct species at least in the Recent fauna."

Puncturella cucullata attains a larger size in Alaskan waters than it does in southern California. Mr. Willett has Alaskan specimens that measure over 30 mm. in longer basal diameter whereas Catalina Island individuals rarely measure over 18 or 20 mm. In the north it occurs at low tide line but in southern California it is obtained only by dredging ."

Collecting data: Dredged in 20 to 40 fathoms off Monterey, Calif.: Redondo Beach in 25, 50 and 75 fms.; off El Segundo in 35 fms.; common in the Pleistocene of San Pedro. (Burch); Catalina Island in 35 fms. (Rowe); Forrester Island, Alaska (Willett); Puget Sound (Randolph) (San Diego Museum); Sawmill Bay, Evans Island,; Drier Bay, Pr. Wm. Snd.; Izhut Bay, Afognak Island and Raspberry Island, Alaska (Eyerdam); dredged on mud bottom; Hinchinbrook Island (Norberg) (Eyerdam).

Puncturella multistriata Dall,1914. Atka Island, Aleutians, south to San Diego and Cortez Bank, Calif. Type locality : Dr. A.M. Keen advises " The type locality of P. multistriata is Station 2466, Strait of Fuca, 56 fms., according to the holotype label."

Collecting data: Dredged off San Juan Islands, Puget Sound in 50 fms. (Miss Ruth E, Coats); Seymour Narrows, B.C.; Izhut Bay, Afognak Island, Alaska; San Juan Islands, Wash. (W.J. Eyerdam); Hinchinbrook Island (Norberg) (Eyerdam).

Puncturella longifissa Dall,1914. Bering Island, Bering Sea.

Puncturella cooperi Carpenter,1864. Kasaan Bay, Alaska to San Diego in 50 fms. (Kelsey). Type locality: Dr. A.M. Keen advises Catalina Island according to the holotype label.

Collecting data: Dredged off Redondo Beach in 25 to 75 fms.; common in the Pleistocene of Timm's Point, San Pedro. (Burch).; Catalina Island in 35 fms. (Lowe); Forrester Island (Willett) (San Diego Museum).

Puncturella delosi Arnold,1907. (P. caryophyla Dall,1914.) Off Point Vincente, Calif. in 12 fms. (Gregg) south to off San Diego, Calif. in 67 to 81 fms. Type locality : Bath House Beach, Santa Barbara (Pleistocene).

Dr. A. Myra Keen advises on this species as follows: " Dr. Woodring believes that P. caryophylla is a synonym of P. delosi Arnold,1907 , Smith. Misc. Coll., vol. 50, 1907, p. 439, pl. 57, fig. 5 a-b. "

The only report on this species is from Dr. W.O. Gregg " From the dredgings in 12 fms. off Pt. Vincente I have a single specimen which Mr. Willett and I decided was P. caryophylla Dall. If the identification is correct that is another extension."

Genus Hemitoma Swainson,1840. Type (by monotypy), H. tricostata (Sowerby) = ? Patella octoradiata Gmelin.

It had been our impression that Subemarginula was in the synonymy of Hemitoma . It may be but Dr. A.M. Keen indicates that there is still a question involved, " Patella octoradiata is the genotype of Subemarginula so that apparently the latter is a synonym of Hemitoma, provided octoradiata proves identical with tricostata Sowerby."

Hemitoma bella (Gabb),1865. Forrester Island , Alaska south to San Diego, Calif. (Gripp). Type locality: Monterey, Calif.

The consensus of opinion is that H. yatesii Dall,1901 is identical with this species and should be placed in the synonymy of the typical.

Collecting data: Our experience has been to consider this a very rare species. We have dredged two large specimens from 20 fms. off Monterey, Calif. (Burch); 1 specimen dredged off San Diego (Lowe Collection).

Dr. A.M. Keen notes " The holotype of Hemitoma bella is in the paleontological type collection at the University of California.

Hemitoma golischae (Dall),1916. Type locality: San Nicholas Island, Calif.

Grant and Gale state that this is an extreme instance of Fissurella volcano Reeve having developed an entirely imperforate apex. We have similar specimens as well as others with the apex almost closed. (Burch); Mr. E.P. Chace reports as follows: " I examined the type at two different times. It was collected by the Golisches and I saw it and called it imperforate Fissurella before it was sent to Dr. Dall. Several years later when the Golisch collection was in the Southwest Museum, I had the case opened and again studied the specimen and found no reason to change my mind. "

Minutes of the Conchological Club of Southern Calif.- Feb.,1946 meeting

The Conchological Club of Southern California met tuesday evening, Feb. 5,1946 in the lecture room of the Children's Hall at the Los Angeles M Museum. The meeting was called to order by the president Dr. W.O. Gregg and there were 16 members present, two of the older ones back after a considerable absence were Bill Reeder and Albert Bauman and it was good to have them with us again.

Two new publications were reported " Fishesand Shells of the Pacific World" by Nichols and Bartsch, Mc Millan $2.50 and " Wonders of the Sea" by Shelley, Iris Press $3.00.

Communications were read from H. Carroll McGowan whose address is R.1. Box 73A, 4277 Hollister Ave., Santa Barbara, Calif. who sent greetings to the club and the following request for stamps " I can make very good use of any stamps and revenues you might be able to send me, especially commemoratives, air mail, and the higher value postage. Have lost out on some of the recent commons."

A letter from A. Sorenson tells of an interesting stay of part of October and all of November at Guaymas, Mex. at the Miramar Beach Hotel with the happy combination of delicious sea food and interesting collecting. He had such a good time, in fact, that he threatens to go back for another month or more.

A letter from F.R. Aldrich of Balboa, witha greeting to the club and a record of some good hauls in that vicinity such as 55 Solen rosaceus and 1212 Diplodonta orbella, the most he had ever taken at one time.

An account of his experiences in collecting at Surf while he was still in the army was given by Albery Bauman. From his description it would seem to be a rather easily accessible place and he made a few very good finds.

The regular study was then taken up with Mr. E.P. Chace as leader and notes were taken from the discussions and will be found elsewhere in yhe minutes. The subject mattwr was interestingand continued well up to closing time when the meeting was duly adjourned.

Effie M. Clark, Secretary.

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E.J. Bromell, P.O. Box 708, Winnemucca, Nevada. We are happy to welcome Mr. Bromell to our shell circle.

Fred Jeffers, Kalama, Washington. Is interested in purchasing shells.

Professor T.D.A. Cockerell, 908 10th, Boulder, Colo. Advises that they will not return to Palm Springs next winter and are considering Mexico, South Africa and the West Indies.. The editor would be pleased to be able to go along to any of them.

Mrs. Edward M. Johnson, Box 444, Falmouth, Mass. has been spending the winter at 410 Dixie Parkway, Fort Myers, Florida.

Dr. B.R. Bales is now much better, out and around again.

Dr. F.M. MacFarland, 775 Santa Ynez St., Stanford University, Calif. " I have been quite busy closing things up at the Academy making way for my successor in the presidency. After 12 years of it the Academy deserves a change- and my desk and files a complete cleaning out. Now I am packing up for a couple of months collecting and study in the Newport-San Diego region. During march Mrs. Mac Farland and I expect to be at the Scripps Institution of Oceanography at La Jolla- and in april along the coast at La Laguna and Corona-del-Mar principally. ..."

Mr. Robert H. Moses, 42 Pembury Road, Tottenham, London N. 17, England. " ... During the war I have lost my correspondent who supplied me with S. African shells, also the man from western France. Conchology seems almost dead in England. We have been unable to get to our coasts for the last 6 years and also we are all getting older and less able to rough it. I wish you and the club all kinds of good luck for the future."

Mr. R. Winckworth, 71 Whitworth Road, London SE 25, England.

The following correction of our conclusions is greatly appreciated. We are accepting the advice and changing our labels accordingly. Members are advised to change the copy to conform to the following data.

" I was delighted to get your generous gift of so many numbers of the Minutes of the Conchological Club of Southern California as well as the book on Pelecypoda and the Glossary. I forsee much interesting reading on spare evenings.

The only point I should like to raise is on Pedalion , which cannot be regarded as a valid generic name as used by Huddesford in his edition of Lister, published in 1770. The full quotation is:

Index .... juxta methodium ... Linne'	English Names
.	.
.	.
Ostrea	Oister
.	.
.	.
30 Isognum	30 Pedalion Rudder Solander

Iredale who first drew attention to the existence of the name Pedalion as a matter of historical interest does not use or recognize the name as valid. In the Great Barrier Reef Sci. Rep. (Mollusca 1) 5 ,319 (1939) under Isognomon he gives :

1786 Isognomon Solander, Cat. Portt. Mus. pp. 9,41,52,115,137. Tautotype: L.lignea * Ostrea isognomon Linne' . Also spelt Isognoma (on pp 9,115,137).

... Prashad points out that there is no justification for his (I males) lat r suggestion that Pedalion (Solander) Huddesford should replace Isognomon . I did not suggest this."

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Dr. F. Haas, Chicago Natural History Museum, Roosevelt Road and Field Drive, Chicago 5, Illinois.

We are flattered by the generous letter from Dr. Haas and appreciate the information on the Norrisia .

" Yesterday, No. 57 of the Minutes of the Conchological Club of Southern California was received and is appreciated as all the other numbers have been. I have decided to stop all my- only occasional- study of West coast forms until the critical list with classification keys, as it is started and carried forth to a great extent in the " Minutes" will be finished; that will save me much trouble of going into the literature for details. You certainly did and are still rendering an important service to all shell people who have to do with West coast shells.

I hope you will not mind a short note concerning the comment of my good and kind friend, Dr. Joshua L. Baily, on the nucleus of Norrisia norrisii (No. 57, p. 34). It so happened that a few years ago, I studied the spiral whorls of Norrisia and I found them dextral, as all the rest of the shell, and provided, furthermore, with a spiral sculpture which is lacking to the later whorls. For reference see: Zool. Ser. Field Mus. Nat. Hist. 24, p. 170, pl.2, fig.g, 1941 (- Malacological Notes,II). I am almost sure that I sent you a copy of this publication:..."

Mr. H.J. Koch, P.O. Dynamite Factory, Somerset West, South Africa.

" .... I have just returned from leave and have brought back a very valuable series of Patella which I hope to be describing soon. No new species but most interesting gradations in form within the species."

We are pleased to send Mr. Koch a file of all of our available Issues as requested.

We are in receipt of the following interesting letter from the Philippines. It is addressed to the Editor, Conchological Club of Southern California (Through the office of the President of the Philippines, Manila).

Sir:

At the outbreak of World War II, the Scientific Library of the Bureau of Science, an office under this department , had one of the largest and best known collections of technical and scientific publications in this part of the Orient. This same library was destroyed by the Japanese during the war.

We shall appreciate it, therefore, if you will help us in the task of building anew from scratch some such collection by donating to the library whatever publications you can spare now and in the future. Please send them addressed to: Scientific Library, Bureau of Science, Manila, Philippines. Very respectfully, Jose S. Camus, Under Secretary. "

We have mailed them a complete file of all of our available publications. Members in possession of duplicate publications could scarcely find a more deserving place to send them.

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Wm. L. Kelley, 120 Chandler St., Worcester, Mass. Is interested in buying shells.

Mrs. R. Turtado, Kellog Creek, Byron ,,Calif. Asks to buy shells.

Mrs. Godfrey Yaeger, 7500 N. Keystone Ave., Indianapolis 44, Indiana. Is interested in buying shells in connection with Girl Scout work.

Harold N. Vars, Rt. 2, Westerly, R.I. Asks about buying shells.

D. Thaanum, 43 Coelho Way, Honolulu, Hawaii. We were happy to have a Happy New Year from Mr. Thaanum, know that he is well and of course, thank him for his generous contribution to our publishing fund.

Roy L. Morrison, 3745 Grim Ave., San Diego 4, Calif. " Enclosed find check for shell minutes. Havent beenable to take in any of the low tides this winter. Hope to get in on some in March."

Mr. and Mrs. Charles H. Lonegrove, c/o General Delivery, Wayneshow, Va. Inquire about purchasing shells.

Glenn R. Webb, Ohio, Illinois. We were glad to have a nice letter from Glenn and join him in his " Here's hoping I may meet you and others of my California conchological friends at the Amer. Malacological Union meetings which are being planned this year. It has been a long time since my short stay at Los Angeles."

Wray Harris, Bishop Museum, Honolulu 35, T. Hawaii/ This is the correct address. In some way we published Honolulu 10 instead of 35.

Captain C.M. Dumbauld, U.S. Naval Hospital, Balboa, Canal Zone, Box 45, Navy 121, c/o F.P.O., New York. " The back copies of your Minutes arrived several days ago and I have difficulty tearing myself away from them. I find the condensed keys from A.M. Strong's notebook particularly useful. Could you tell me if this notebook has ever been published or if publication is contemplated? The shell language is for the most part new to me and I find some of the descriptive terms difficult to apply. Has a glossary of terms used in shell descriptions ever been published ? I find the one in Sea Beach at Ebb Tide much too brief. ..."

By this time you will all have our illustrated glossary of terms for the Pelecypoda. We expect to publish a similar work covering the terms for all other groups. And incidentally we wish to perfect it by adding in these minutes other terms which may have been ommited. Please write in advising us of needed additions. Mr. Strong's notebook has never been published but his work is being published regularly in several established journals.

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An addition or correction should be noted on our report on the Phasianellidae. Mr. String states that we have no true Phasianella.

Eulithidium are being recognized as full genera.

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Minutes of the Conchological Club- March meeting

The Conchological Club of Southern California met in the Directors Room of the Los Angeles Co. Museum, March 5, 1946, at the usual hour. This change of meeting place was for the one time only due to another meeting which this smaller room would not accomodate.

The meeting was called to order by the President, Dr. W.O. Gregg. There were 14 members present , two of them, Mr. and Mrs. E. Cameron, having been long absent were most welcome. There were no standing committee reports and but one communication- from Mr. E.J. Post of Tampa, Fla who told of failing health and inability to do much collecting. For members who may wish to write him, his address is R. 6, Box 283. Attention was called to the meeting of the Pacific Shell Club held on the third sunday of each month at 2:30 P.M. in the Directors Room of the Museum.

The lesson, this time on *Calliostoma* and *Margarita* had so much of interest to discuss that there was not time to complete it before the closing hour and it will be taken up again at the next meeting. The comments of members will appear in the minutes at a later date. Mr. Chace led most ably in these discussions. The meeting was duly adjourned.

Effie M. Clark, Secretary.

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George P. Kankoff, Curatorical Asst. in Paleontology, Los Angeles County Museum, Exposition Park, Los Angeles 7, Calif.

" It has been more than three months since I finished with the war work and returned to the museum. Those thirty months were very uninteresting and the shells I worked on were all alike- 155 mm. ... Since I have returned to my work , I have been working on Rancho La Brea material with Dr. Pierce; washing the material in benzol, sifting it and sorting it by a different method with the result that we have a long series of tiny bones in thousands, amphibian, reptilian elements and bird material in such abundance that it will take several specialists years to study it. Dr. Pierce has so far separated 125 species of insects and a few new ones.

In my department (Invertebrate Paleontology) I am straightening out collections in chronological order and working about three hours a day on Newport Esturary material. As you probably know, Mr. Willett completed a brief description of the three localities on the Irvine Estate. It was his desire that I should get more of that material. It is the warmest of all the san Pedro series. I became very excited when Mr. Grouard of Santa Ana brought us *Phyllonotus radix nigritus*. A group of us, accompanied by Mrs. Clark and Miss Cook, were taken there by the Marsch family, and Mr. Grouard and Mr. Sprague showed us the places where they found a new *Turbonilla* and the *Phyllonotus*. When three hundred pounds of the material had been sorted Mr. Willett became very interested. This material has such an unusual proportion of species (about 10 new species of mollusca, bryozoan and crustacean) that at a glance it differs from any other San Pedro deposit. This was in 1940. In November,1942, Mr. Willett, Dr. Chester Stock, and I , visited this locality and brought back an additional 75 poinds of siftings from the southern locality. Then the war broke out and I had to take a leave of absence from the Museum in order. Now I have gone through two tons of material and have many more records. I am writing all this to you not only to get it off my chest, but also to let you know that as far as the Paleontology Department is concerned, the war is over. We have a great amount of the most valuable material and it will be at the service of all at any time, especially when I shall have completed weeding out and arranging the collections by periods. (con.)

It left me broken hearted when I read in the Minutes that Mrs, Clark is intending to send her fossil material to the U.S. National Museum. Did she forget about our museum ? I want to take this opportunity to remind our club members that business is now going on as usual ; that we have wonderful matwrial like Playa del Rey, Capistrano, Outfall Sewer Material, Lumberyward and many other collections containing thousands of perfect specimens with Mr. Willett's identifications. Lately we boosted up our Cretaceous material by adding tha t of Trabuco, Modjesca and Santiago Canyons. We have an abundance of fossil fish matwrial and out paleobotany collection has doubled in three years. The less complete collections are Hilltop Quarry and Timm's Point. Perhaps some of the members have some siftings from these localities left. They would be of the greatest help. I will be happy to show you our latest achievements if it will be possible for you to come to the museum....."

Beatrice Hodge, " Spindrift", 1663 North Atlantic Boulevard, R.R. 2, Fort Lauderdale, Florida. We are happy to add Miss Hodge to our shell circle. " My aunt is an invalid and she is most interested in our shell collection. We now have shells from all over the world. Have you any unusual chitons, Pectens, Spondylus, Acmaea, Fissurellas or Abalones for sale ? Also we are much interested in Cypraea. I am going collecting on the Keys in the spring and hope to find some rare specimens of Pectens."

Harold Harry, R 2, Box 222, Shreveport, Louisiana. " ... I have been at home less than a week, during which time I rushed madly into the task (rather pleasure) of unpacking. Things in that line are really in hand. Of the shells I managed to bring home alive, only the Pythia and Truncatella of Ulitii and one Cyclophorus of Io Shisma survived. One Pythia from Samar, P.I. will have been in captivity one year on Feb. 21 and under very adwwrse conditions. They are sluggish now, as our temperature ranges from 40 to 80 degrees and the house is poorly heated. Managed to add some Bradybaona and Ruminia to the little zoo while in New Orleans. But Ruminia is carniverous and must be segregated. Have letters from Dr. Gregg, Miss Shepard, and Glenn Webb which demand attention as well as many leads in " Min. of C.C.S.C." Would you believe it I spent no less than 8 hours last evening doing nothing but reading the Minutes. Finished the first half of them. I found it literally useless to try and wade into all the boxes of material I have until I had first gone over the Minutes again. In about a week I(ll have something to write about. Hope you are all well. Civilian life is very close to what heaven must be like (at least so far, I hasten to add.)"

" During the second voyage I was pleased to correspond with Dr. C. Montague Cooke, of B.P.P. Museum and have duplicates of some land shells from the pacific islands which were the subject of our letter writing."

" During the spring I shall be at home, and shall devote the greater part of my time to conchology. Will probably return to school in the fall- but of all that I shall write later. Anyhow, greetings to you one and all. Sorry not to see you before going home. "

Mrs. Ida Worthy, Patumahoe, Auckland, New Zealand. We are pleased to have a nice letter from our New Zealand friend and wish herewith to acknowledge receipt of the box of shells adding to our series of New Zealand species. We are flattered again by the comment ..." The work you have put into the different families have been a great help in arranging the groups in our collections here in N.Z. and sorting out etc. "

Incidentally members interested in exchanging for fine material should certainly write Mrs. Worthy. Your editor has hundreds of beautiful sets under her collecting label.

E.S. Richardson, 25 A Carlson Gone Rd., Auckland C3, New Zealand. " The members of the Auckland Museum Conchology Club desire to become corresponding members with your club, and as such have asked me as secretary for this year to write offering our club notes in exchange for your own. " " .. We send greetings to the conchologists and paleontologists of your club."

A rough estimate is that we are mailing about 25 or more copies of our minutes to various correspondents in New Zealand and are in return receiving their excellent mimeographed proceedings.

Mr . F.E. Shafer, R.R. 1, Trenton, Ohio. Many of us have beautiful material from Mr. Shafer while he was living in Cebu, Philippines. " ... Although I have written many letters to P.I. friends, I have had very few replies. One of the officers of the corporation that employed me before the war is now back in Manila whwre he is liquidating such corporation assets as may have survived the Japs. He is an able business man- an executive who really knows his Philippines. I have written to him by air mail and may have a reply soon. If I hear from him I will be in a position to make more or less definite plans re my return to the P.I. I will be here for a long time yet so please mail me anything re shells that you can spare me. Mc. Pedro de Mesa is well known to me. He is my friend and we have each visited the home of the other. I visited him while he lived in Manila- a few months before the war. Mr. De Mes a returned to his former home at Lubang, Mindoro where I understand he owns his own property. I wrote hime there less than a monthago. Mr. De Mesa is honest and dependable which is more than I can say of several well known P.I. dealers and collectors. Before the war de Mesa and I were planning to work together and we corresponded regularly. I sincerely hope that Pedro has come through in good shape and that we will soon hear from him. Your Manila letter is not apt to reach him so I have given you above his last address as known to me. Just before the war Mr. de Mesas son (now mature) was working with his father at shell collecting and I hope to hear from him if his father does not write. I have forgotten the son's first name. Once I received pamphlets from Dr. Bartsch on land mollusks of the P.I. Please let me know his initials and address as I want to write to him. * (Dr. Paul Bartsch, U.S. National Museum., Washington 25, D.C.)* There was also a man living at Lantana, Florida, who sent me a book he had written on shells which was of help to me. If you know him please furnish me his address. * Dr. Maxwell Smith, Box 65, Winter Park, Florida.* I would like to get Dr. Bartsch ('s book before I get Mr. Webb's book or books. Perhaps you have seen that Jap book with colored plates. That book helped a lot as many of the species pictured therein were also P.I. species. Is there any magazine that would help ? If so please advice as to where same can be obtained. I surely need a review after three years in tha t Jap held old city of Cebu. Before the war and old and dear friend of mine lived in Los Angeles. His wife had an interior decorating business. I have lost his address. His name is J.W. Schilling. If he is listed in your directory would you mind sending me his address. ... Dr. Asela Franco of Cebu City both collects and sells shells. She also has a considerable stock of Japanese postage stamps as used in the Philippines during the Jap invasion. Mrs. Helen Schlinger of Davao City, Davao, P.I. was a bigger dealer by fat than Dr . Franco . Dr. Franco survived the war. I do not know whether Mrs . Schlinger survived. ...."

We have just mailed Mr. Shafer a complete file of all available papwrs of our proceedings. Other members having duplicate books are invited to write him.

Mr. E.J. Post, 609 W. Emma St., Tampa 3, Florida. Mr. Post is one of our own most active of active members and the fact that he is now living in Tampa will nev r remove his name from our list of active members. We are indeed sorry to hear that he has not been in gold health. " I have not been over to the club at St. Pet. since I have been here. I have seen Mr. Emery once or twice. He is not very strong eather."

Mr. C.L. Blakeslee, Mendon Center Road, Pittsford, N.Y. " I took out the Brachiopoda the other evening, that you once sent me with your usual kindness and it then occured to me that you might like some Cepaea or Helix nemoralis that I collected from a colony that I discovered here last summer (You may have noticed an account of it in the latest issue of the Nautilus). So tonight I got busy and selected a hundred from the quantity that I have and they are now in a strong- i hope- box and will go forward tomorrow. I made it a hundred as there may be some of your club members who would like a set for their collecyions. And, by the way, Dr. Pilsbry gives them the name of Cepaea. I had quite a little correspondence with him about it a nd it ended with his statement " Helix or Cepaea , it is a matter of majority of opinion, since neither can be said to be definitely the only right one or clearly wrong. In the present case , either Helix or Cepaea is " right" according to excellent authorities. " I had no intention of asking for anything in return when I began this letter but it just came to me that if someone would like to send me half a dozen Helix pisana I coulf use them. I have none."

The shells have arrivedd in perfect condition and will be available to the members when the oditot can again be present with the shells. Any member having duplicated of Helix pisand will be thanked for sending a set to Mr. Blakeslee and needless to say get his pick of a fine set of Mr. Blakeslees shells.

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New Publications

Proceedings of the Malacological Society of London, Vol. 26, part 6m, 31 January, 1946. A review of the many excellent papers in this issue should cover several pages. Therefore, we will simply mention the paper of importance to our own West Coast fauna.

Dr. S.S. Berry , pp 161-166, with two pages of plates and six text figures has given us a paper on Ischnochitonidae . It is a description of Stenoplax (Stenoradsia) heathiana n. sp. This is the species most of us have in our collections labelled Ischnochiton magdalensis Hinds. Dr. Berry states that Hind's species is in reality the species we know as acrior Carp. which left our common species without a name.

The Nautilus, vol. 59, no.3, January, 1946. This issue contains a number of fine papers but none of them dealing with West Coast species. There is a good photograph and a nice article on the life of George Willett.

Genera and Subgenera of the Pelecypod Family Glycymeridae by David Nicol of Stanford University and another paper by the same author " Restudy of Some Miocene Species of Glycymeris from Central America and Colombia". Both papers are published in the Journal of Paleontology, vol. 19, no.6, Nov., 1945. The work is well done and well figured and should be in all libraries.

The American Malacological Union, News Bulletin and Annual Report, 1944-1945. The membership list to date along with the many news items about members together with a number of well-written papers makes this about the best of the annual reports. Mrs. Robertson should be congratulated. Incidentally all persons interested in shells should be members of the American Malacological Union. The dues are but $1.00 per year and should be mailed to Mrs. Harold R. Robertson, 136 Buffum St., Buffalo, N.Y.

The Value of Mussel Distribution in Tracing Stream Confluence by Dr. Henry Van Der Schalie- 19 pages and a number of plates. Published in Papers of the Michigan Academy of Science and Arts and Letters, vol. XXX, 1944.

Joseph Pitty Couthouy- A Bibliography and Catalogue of His Species by Richard I. Johnson. Occasional Papers on Mollusks, Dept. of Mollusks, Mus. of Comparative Zoology, Harvard College. vol. 1, no.5, Feb. 14,1946. Another paper in this series vol.1, no.6 is:
The Egg and Breeding Habits of Oncomelania quadrasi Mlldf., the Schistomiasis Snail of the Philippines by Lieutenant Tucker Abbott.

Vitrinellidae and Similar Gastropods of the Panamic Province, Part I by Henry A. Pilsbry and Axel A. Olsson, Proceedings of the Academy of Natural Sciences of Philadelphia, vol. XCVII,1945, pp. 249-278.
This carefully prepared work dealing with West Coast species should be in all libraries on this coast.

A Bibliography and Short Biographical Sketch of William Healey Dall by Paul Bartsch, Harald Alfred Rehder and Beulah Shields, Smithsonian Miscellaneous Collections, vol. 104, no. 15, Jan. 30,1946. This list of Dr. Dall's works will be of particular value especially to those of us who wish if possible to add all of Dr. Dall's work on West Coast species to their libraries. Perhaps some of them are still available.

Revista De La Sociedad Malacologica " Carlos De La Torre", vol. 3, Dec. 1945, no.3. This excellent publication in Spanish should certainly be in every conchological library. The address is Apartado 2634, Habana,Cuba. $2.50 per year.

Mollusca, vol. 1, no.8, Feb.25,1946 published by Paul H. Reed, Box 267, Tavaros, Florida. Price $2.50 per year. Mr. Reed is to be congratulated on the continued excellence of his periodical. It has become a necessary part of every conchological library. A number of new species have been described and beautifully figured in Mollusca as well as many other fine papers by conchologists of international repuration. If you are not now a subscriber to Mollusca you are missing something.

The Natural History Museum Bulletin of the Natural History Museum, Balboa Park, San Diego is on my desk for February and March. All residents of this coast are very proud of the activities of this great institution. However, we will here simply report on the conchological work. " Accessions received by the Conchological Department numbered over 900, of which 330 were new to the collection. The catalogueing of shells was continued. To date 189,664 specimens have been numbered and labelled. The collection has been made available for reference to many people, including servicemen and others seeking identifications etc. " The March issue tells of the many members and friends in the service sending boxes of specimens. All this is added to the several of the finest collections of shells ever accumulated on this coast.

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Ramon Masini, No. 2954, Montevideo, Uruguay. I have on my desk a letter from this gentleman in Spanish in which he advises that he has a very large stock of mollusks from his country, marine from the Atlantic, fresh water from the Rio de la Plata, many land shells and also fossil species. These he is desirous of exchanging for specimens from elsewhere.
Your editor regrets that he does not have the time to exchange with him. I trust that other members will enjoy this correspondent.

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Harold J. Jacobs, 538 N. Palos Verdes St., San Pedro, Calif. Mr. Jacobs is a deep sea diver and has been selling some exceedingly rare and fine shells. Those interested in really fine material should write him.

Dr. W.O. Grogg, 2200 S. Harvard Blvd., Los Angeles 7, Calif. " We had a very interesting meeting on Jan. 8. The meeting was devoted to the study of Acmaeas and differences of opinion were amicably discussed. Dr. Hill showed us a specimen of Carinaria which Mr. Bauman had picked up on the beach at Surf, the first I had ever seen.

I will list some of the pertinent matters on the Acmaeas: It is my opinion that the name Acmaea tessulata patina Esch. should be used instead of A. t. scutum Esch. for our common west coast form; reasons given by Dr. Pilsbry, Nautilus 36:71. This would not hold true if there were an earlier reviser than Carpenter who used the name A. scutum for the species. I note that under A. tessulata you list A. emydiaa as a synonym. I am unfamiliar with A. emydia and have never read its description but the thing from Drier Bay, Alaska, which Dr. Dall identified for me as A. emydia is nothing but a color form of A. persona. It is an elevated shell and has the typical sculpture of persona. Doubtless other records are based on such misidentifications. How far south does true A. patina (or scutum if such you wish to call it) extend ? Neither Mr. Chace nor I have ever seen specimens from south of Cayucos and I am definitely of the opinion that southern records are based on misidentifications.

I consider A. nacelloides, A. monticola, A. olympica and A. hybrida but situs forms of A. pelta Esch.

Specimens identified by Dall Dall as Acmaea atrata Carp. (mentioned in Minutes 57:15) are obviously unusually elevated forms of A. conus Test. They are very different from specimens of Acmaea atrata from Magdalena Bay. Lower California. I am of the opinion that other reports of A. atrata from the coast of California represent similar misidentifications.

Phasianella lurida Dall: I have specimens of this from Pt. Reyes, Calif. Specimens in my collection labelled P.lurida from Piedras Blancas are P. pulloides.

In Strong's key to the Turbinidae on pages 20 and 21 it would appear that Homolapoma carpenteri and H. luridum are reversed.

I have a specimen of Tegula from Pt. Vicente which Dr. Dall identified as young Tegula impressa (Jonas), with the note " Most northern locality yet noted". I had previously considered it to be a young and unusually colored specimen of T. ligulata but a careful study of its mivroscopic sculpture and the shape of the umbilicus and comparison with young of T. ligulata reveals it to be a distinctly different thing."

" Have gone over the notes in Minutes #58 (March). When you are at home and have time I would like to go over my Margarites material with you. Did I ever give you specimens from the Pt. Reyes lot which Mr. Willett called M. lirulatus obsoletus (Carp). If the identification is correct that is an extension of range."

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C. Ray Fowler, 3615 E. 5th St., Long Beach 4, Calif.
Mrs. O.C. Evers, 412 N. Lake St., Los Angeles 26

The two names above are new members of the Long Beach Shell Club. However, I believe Mrs. Evers will return to Florida in May.

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Mr. E.P. Chace, 24205 Eshelman Ave., Lomita, Calif. I am glad to have the following comments from the club members on some of our recent reports.

Cucxulinidae- No comments

Phasianellidae-- T. compta- Some of the club questioned the extreme ranges. Say large T. pulloides could be confused with T. compta.

T. pulloides- May go down the Lower Calif. coast but not into the gulf. A.M.S.

(con.)

Astraea undosa- 2 more loc records if you want to use them. Santa Barbara- Albert Bauman, Carpenteria- Gillis. Southern range " almost to Scammon's Lagoon" A.M.S.

Astraea gibberosa Dall. O.K. by the club. My own comment is that Dall's ~~pac~~ pacifica is a ½ grown shell and montereyensis Oldroyd the mature form, and that the artist who made the figures for Martyn rather exagerated the bumps on the periphery of the whorl and did a bum job generally.

Homolapoma baculum. Point Arguillo (Albert Bauman). Northern records in question- the Puget Sound records are almost certainly based on the shells that were later described as H. engbergi.

Liotia- Arene a. bristolae. Range in list, page 25 gives San Pedro- on the next page gives San Diego.

Page 30 in the Key. gemmulatum is given as San Pedro to the Gulf. I have specimens from Cayucos. E.P.C.

Norrisia norrisii. Monterey record heeds checking. No member has it from that far horth.

Tegula gallina- " Not in the Gulf" A.M.S. No criticism of your statements about the varieties.

Tegula brunneum- Crescent City, Calif. Chace.

Tegula b. fluctuosa - Those who said anything on this felt as you do. Var. of little value.

Tegula montereyi- add if you wish, Morro - in the bay (M. Caruthers).

Tegula regina- H. Jacobs has brought up two. Expects to go back and get more. Add Santa Barbara Island to the range.

On Margarites- A.M. Strong's comments- Carpenter's species are practically nude names. Some of the species were in the Cooper collection and the mice got into it and destroyed most of the labels. It is at U.C. Dall figures a lot of Margarites in Bull. 112 but the figures do not fit the Carpenter descriptions. Some species may be in the Carpenter collection at McGill Univ., Montreal (See Art. in recent Nautilus). The Cooper shells were described in an old Calif. Acad, paper and the Calif. Acad, has a copy of it (Most copies were destroyed in the big quake and fire). Cooper's shells were dredged off Catalina Island but the locality given for them is as you gave it- San Diego-San Pedro area.

Margarites optabilis- Has been taken at San Luis Obispo by M. Caruthers. Comment that it is quite variable.

Turcica caffea Gabb- Has been taken at San Onofre (dead or crab specimens)

Calliostoma gloriosum- Has been taken in Morro Bay by M. Caruthers (June)

Calliostoma eximium- Strong says " some Central American point but not in the Gulf fauna, or north of there."

Calliotoma tricolor- I have specimens from the San Pedro breakwater years ago.

C. ligatus (Gould) (C. costatum) - San Diego record probably an error

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Dr. A. Myra Keen, Box 1563, Stanford University,Calif. Looking over the February Minutes (No. 57), I am puzzled by your reference on p. 11 to Acmaea hybrida Shepard. Although there is a mention in our copy of Nautilus vol.9, p.72, of the variety in question, it is a nomen nudum, there being no word of description. A half hour's search of the literature fails to bring to light the paragraph you quote. " * Note* That reference was copied from some data from Mrs. Test. Perhaps the editor overlooked something *

" Recently Stanford University received a donation from Mrs. Charles L. Simons consisting of over 400 species of microscopic shells, mostly West Coast gastropods."

New Publications

Dodge, Henry, " Notes on Strombus dentatus Linne and the Strombus urceus Complex", American Museum Novitates, No. 1314, March 14,1946.
This is a very interesting paper of 8 pages and 8 8 figures.

Clench, William J., " The Poison Cone Shell", Occasional Papers on Mollusks, vol. 1, no. 7, March 15,1946.
This is a republication of Dr. Clench's paper published some time ago in the Amer. Jour. of Tropical Medicine, with some additional data and figures.

Report of the U.S. National Museum for 1944. 100 pages.

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All students of natural history will mourn the passing of Dr. Clinton G. Abbott, Director of the San Diego Museum of Natural History. While it is true that Dr. Abbott's specialty was ornithology, he was always interested and glad to give every possible assistance to students in all groups of natural history study.

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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA- April,1946.

The Conchological Club of Southern California met at the usual time and place tuesday, April 2,1946. The meeting was called to order by Dr. Gregg. There were eleven members present and one visitor, Arthur C. Bird, who expressed a desire to join the club. There were no reports from the standing committees.

A program of papers to be given in connection with our regular study schedule was arranged for the next three meetings as follows:
May- Mrs. Mary Turver, " Collecting in Mexico".
June- E.P. Chace, " Chitons of Australia".
July- A.M. Strong, " Cones of the West Coast".

The scheduled study used up the rest of the time. It concerned Vitrinellidae, such tiny shells that most of us know very little about them, but which are very beautiful and interesting. The meeting was then duly adjourned. Effie M. Clark, Secretary.

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E.V. Edmonds, Amherst Hotel, 2231 Shattuck Ave., Berkeley, Calif.

The above is " Eve's" new address. Mrs. Edmonds and Bob are joining him there.

Donald Cordry,Fray Angelico #30, Mixcoac, D.F., Mexico. " I am a collector of marine shells and would be most grateful for your list of specimens. Am going on a collecting trip in the near future (Acapulco) and will be glad to look for things that you are particularly interested in, if you tell me what you want. I have several fine Spondylus limbatus, 5 and 6 inch examples that I would like to exchange for Spondylus pictorum. I am interested in Conus and expect to get good examples of the following on my trip: Conus princeps, purpurescens, brunneus, pyriformis; Thais triserialis biserialis, kiosquiformis; Vasum caestus; Phyllonotus princeps, oxycantha. If there is anything special that you want let me know."

Captain Carl Mathews Dumbauld, 59204, U.S. Naval Hospital, Portsmouth, Va. Captain Dumbauld has been serving in Panama. The above is his new address.

Garrett, Wendell, 4456 Verdemour Ave., Los Angeles 32, Calif. asks about buying shells.

Dr. Wm. G. Fargo, is now back in his Michigan home, 506 Union St., Jackson, Michigan.

Friends of Colonel H.G. Schenck of Stanford University will find the following of particular interest.

Nippon Times, Wed., Feb. 20,1946. And also the following account in Stars and Stripes, Feb.20,1946. " American Officer 2nd U.S. Soldier to Meet Emperor- Tokyo (INS).- Col. H.G. Schenck, of Palo Alto, Calif., became the second American officer to talk to Emperor Hirohito since the war when he met the Japanese ruler in the biological laboratory within the palace grounds.

Gen. Douglas MacArthur was the first officer to meet Hirohito.

Schenck, who heads MacArthur's natural resources section, was inspecting the collection of shellfish in the laboratory when Hirohito walked in. The emperor, himself a biologist, had a long discussion with the American officer, and asked him about Dr. Henry Pilsbry of Philadelphia, who has done extensive work in this field."

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Wray Harris, Honolulu, T. Hawaii " Captain S.M. Kimball passed through Honolulu last week on his way home from duty at Okinawa. He brought with him the first Ryu Kyu collection of shells I have seen, and I think the largest from that region. Is on his way to Weaverville, Calif. where he will work up his Pacific Area material."

Charles D. Nelson, R #5, Lake Michigan Dr., Grand Rapids, Mich. We wish to thank our friend Nelson for the fine box of fresh water shells recently received, but are concerned over his report that he has been having trouble with his eyes and expects to have one eye operated on soon.
He asked for the Turbers address- Mr. and Mrs. H.R. Turver, 8640 Evergreen Ave., South Gate, Calif.

H.S. Mort, 13 Milner St., Mossman, N.S.W., Australia. " In one of your recent Minutes (October I think), the American Janthinas were discussed. Many years ago I think about 1928, our beaches were covered with a species we used to call exigua, but is now classified by Iredale as I. caprcolata Montrowzier. This is very similar to your bifida, but judging by specimens of bifida which Mr. Caruthers sent me from California, our shell is larger and the sculpture more pronounced. I am getting Mrs. Woolacott to send you a small parcel of these from my duplicatesand should be glad to have an opinion of them from Dr. Myra Keen or some other authorityas to whether she considers them to be distinct from bifida or not. I shall be glad if you will distribute any surplus shells among your members. They were collected at Sarrabeen Beach, about 7 miles north of Port Jackson, and at the time all beaches within 30 miles of Sydney were thick with them; I made a check of one section and found between 200 and 300 shells per yard of beach, and as there are over twenty miles of similar beach near Sydney it would make well over 10 million shells near Sydney alone. This species is normally less common than the fragilis type , but appears to have about a 4 year cycle when it is more plentiful. I. globosa is a much rarer shell and I have never seen it in large quantities on the beaches. By the way I have had shells labelled globosa from Florida which are much paler than ours and correspond exactly with the figure of I hervieri in Tryon. The largest specimens of the fragilis type I have seen were from Norfolk Island, although I have very large ones from Cape Byron (most easterly point of Australia.)

With regard to the spelling of Ianthina, mentioned in your February Minutes the majority of English words beginning with J came through the French and the J has been adopted from that language, but Ianthina comes directly from the Greek (which had no J), and for that reason I certainly prefer to spell it with an I. I fancy that taxonomically Ianthina is older

(con.)

as all the older books seem to use it. I hope it will not be troubling you too much to get an American opinion on my specimens, although Iredale is seldom wrong in his identification of local species, it is always well to get another opinion, especially in the case of a pelagic genus like *Ianthina*.

Wishing Tom and yourself, also the Conchological Club the best of hunting in 1946. I always look forward to the arrival of the " Minutes".

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This is a very fitting place to announce the arrival on March 12 of Ruth Janthina Burch, daughter of Thomas A. and Beatrice Burch. No- your editor does not feel any older, having already become accustomed to being called " Gramps".

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A. Sorensen, 247 Granite, Pacific Grove, Calif. The editor and Mrs. Burch had the pleasure of being " Andy's" house guest for a night a week or two ago. We all enjoyed a lecture by Dr. Bolin of the Hopkins Marine Sta. on " Deep Sea Fish". Andy had just returned from Guaymas with a large lot of beautiful and some very rare material. However, he is even now off on another jaunt to Punta Penasco, Mexico after more.

Ernest N. Wilcox, 1738 Johnson Ave., San Luis Obispo, Calif. We were also the house guest of our member and enthusiastic collector in San Luis Co. Mr. Wilcox devotes his time to shell collecting and his art. His paintings are remarkably fine.

George Pattison, 68 Partridge St., Glenelg, South Australia. I have just received the January " Minutes of the C.C. of S.C." Your Minutes are appreciated and found valuable for reference. So my wife binds them together in book form for that purpose. I am interested in: Marine Life in General- World Wide Sea Shells- Land and Fresh Water Shells- Buy Books on Shells Illustrated and Described.

I have spent most of my life seafaring in wind jammers of every rig, and lighthouse keeping until I retired 14 years ago. For 40 years I have been a keen conchologist. So a big fraternal Cheerio of good wishes to you and members of your club."

Dr. W.O. Gregg, 2200 S. Harvard Blvd., Los Angeles 7, Calif. " This rain should be good for land snails (March 30,1946). Last Sunday I went up into Kern County and found live *Helminthoglypta berryi*. Some of these days I will write a paragraph or two on its ecology and also soon I will write up my five day trip into San Diego and Riverside counties. On the San Diego trip one of the snails we found appears to be one of the lost species. More about it in my story. "

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Many of us have received fine specimens from Mr. Ramon Fontecha formerly of Davao City, Philippines. Mr. A. Sorensen had sent him a letter by air mail immediately after the end of the war. We were shocked to see the terse comment on the envelope returned to Mr. Sorensen " Mr. Fontecha was killed by the Japs."

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Mr. Pedro De Mesa, Lubang, Mindanao, Philippines. " Your letter of Sept. 2 received. Thanks that a friend in Manila P.O. found it. The house I rented in Manila (in Zaragoza St.) got burned and the shells I collected from Mindanao,Samar,Cebu,Iloilo and Leyte that I left there when we evacuated got all burned. My big collection not only of P.I. shells but also shells from N.and S. America and foreign countries acquired for 30 years until 1941- got burned in Lubang. The Japs burned half of this town when they retreated to the mountains and our three houses were included. My collection of old books, stamps, coins, medals, old china dishes

(con.)

and antique furniture turned into ashes. When we evacuated the town we were ableto take along with us two sets of clothing and dresses for every member of the family so that after six months all became worn out so we remain barefooted and almost naked when Lubang was liberated (April 1, 1945). Lubang Id. being isolated and small, never been reached by relief of any kind from the Govt., Red Cross or the Army. The black market is terrible so you can immagine how hard it is to one who will have to start buying everything of needed materials in life at least one piece of every kind for every member of the family. I have appealed to various collectors on the Atlantic coast , like Dr. Clench of Harvard to help a fellow human being in distress. I am at a loss now. Do not know where to begin and how to start. If you are acquainted with the Red Cross chapter in your city please help us to secure some things of any kind- at least those needed for the four baby girls- ages- 3-2½-1 yrs. old- and one 3 months old. Two of these are crippled as a result of living in jungles to be far away from Jap barbarisms and atrocities. Second hand and worn out baby dresses will help lots- we can repair them. Thanks for the thought please. Once we get a little bit settled I shall resume collecting shells again. I am now more interested in the snails that are intermediary to human diseases as blood flukes, liver flukes and the like. Best wishes and kindest regards to you and yours with prayers.

P.S.- Till now, there are 50 Japs alive with arms on the mountains of Lubang. We have no army here except two policemen.

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Mr. De Mesa also sent a 3 page legal size document, certified and sworn to giving a detailed account of his heroic assistance to our armed forces throughout the war.

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A further note on the above may be that we have just mailed Mr. De Mesa the fourth box of baby clothes and trust that other members will also do what they can.

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Mr. Otello Ciarla, Rua Augusta na 91, Rio de Janeiro, Brazil. Mr. Ciarla is a member of the ".American Malacological Union" and interested in West Coast shells.

Glenn Webb, Ohio, Illinois is now at the University of Illinois and we hear quite happy about it.

Harold Harry, Rt. 2, Box 222, Shreveport, La. We are happy to learn that our friend and fellow member expects to enter Stanford and later study at the Hopkins Marine Station so we will again have him with us on this coast. Also the editor wishes to thank him for the fine box of duplicate shells.

Mr . Arthur White, 11 Porter St., Everett 49, Mass. Mr. White is interested in purchasing shells. Is particularly interested at this time in Scaphopoda.

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More New Publications Received

Dr. S. Stillman Berry, " Two New Chitons from the Gulf of California", The American Midland Naturalist, vol. 34, no. 2, pp 491-495,

This paper is prepared with the usual thoroughness of Dr. Berry and should certainly be in the library of all interested in this group.

SHELL NOTES, by Frank Lyman, Lantana, Florida. Numbers 15 and 16 arrived together. Frank is now republishing with all plates the rare book "Shells Which Have a Fascinating Story" by Howard Gilmore. His paper seems to improve with every issue. If not on his list you should be.

Auckland Museum Conchology Club have sent out their interesting Feb. bulletin with many items on the fauna of New Zealand.

Minutes of the Long Beach Shell Club

Feb. 10,1946. The Long Beach Shell Club has decided to continue its wartime schedule so meets in the Childrens room of the public library the afternoon of the second Sunday in the month at 2:30 P.M. This day there were 13 members and 7 visitors. Mrs. Turver was in Mexico collecting shells. Mrs. Evers of Florida was to return to Florida the next day. Patricia Rolo attended for the first time. This year we are to have printed programs for the year and they will be ready soon. The club approved the Agassiz Club resolution favoring a move to obtain a museum for Long Beach with aquarium attached. The speaker was Mr. E.P. Chace who took Acmaeas, " the most diversified group of shells" . Using the new Conchological Ckeck List of the Southern California Club, he explained puzzling items and described habits and habitats of the individuals illustrating with specimens from his own and Mr. Baker's collection. Members felt it one of the most interesting meetings.

March 10,1946- Mrs. Chace served as secretary at this meeting, Mrs. Libby , vice-president had the programsready, but upon suggestion of club members it was decided to back the program with a list of names and addresses of members. Attention was called to an article in current Nautilus of a biography of Mr. George Willett. Laura May Totten was welcomed as a new member. Thanks of the club was extended to Dr. Howard Hill of the L.A. Museum for keeping a changing shell collection in the Long Beach Service Club. The day's program directed by Mr. Chace was a symposium on the lives and works of older conchologists.

April 4,1946- At the April meeting both the president and vice-president were unavoidable absent so the secretary took charge of the business part and Miss Rogers kindly introduced the program and speakers. Mrs. Chace again supplied as secretary. Reference was made to the report that giant snails had been introduced into the Philippines as food for the Japanese and have now become a menace to agriculture. Mr. Ulrich reported a successful collecting trip to Portuguese Bend. Raymond Fowler, a new club member was then presented by Miss Rogers and sketched for the club his introduction to shell collecting when in the third grade, and illustrated the spread of his interest by showing many very beautiful and attractive collections. His deep interest and ease of delivery and laughable personal stories made an enjoyable item on the program. This talk was followed by showing of his own collection by James Gorman, our youngest member. Specimens of live shells collected in Guaymas, Mexico were offered to members by Mrs. Turver. The meeting was then adjourned to view Mr. Ulrich's beautiful collection of shells on display in the library.

Ruth E. Eaton, Secretary.

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W.E. Griffith, 24(Aster) Melita St., Sliema, Malta. We were pleased to have a long letter from our old correspondent in Malta. Many of us have large sets of fine shells from his collecting. However, at this time he seems to have deserted us to some extent and has gone into the postage stamp business. He writes" And would be very pleased if you would put me in touch with anyone either a dealer or collector who would like to do business with me either for cash or exchange, but I am afraid at the moment it must be by exchange. As mails take so long to arrive, you might pass the word that whoever you recommend me to can start by sending me a few say six of each of U.S.A. Commeratives he may have and let me know what he requires. I can supply British Colonials and of course Malta stamps. "

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COLLECTING IN SEAWEED HOLDFASTS

by Allyn G. Smith

Seaweed holdfasts are a good collecting ground for marine shells, which nestle or hide in the twisted mazes of the kelp roots. Those that are torn loose from their rocky moorings and washed ashore after heavy storms often contain species that are rarely found, even by dredging.

On a number of different occasions, when searching the off-shore beds of the giant kelp (Macrocystis) in Monterey and Carmel Bays of California with a row boat, the attempt has been made to pull up the kelp by the roots. This is often impossible if the roots are well anchored as the stems usually break first. Sometimes, however, the attempt has been successful and the holdfast brought to the surface, often with a heavy boulder or slab of rock on which the kelp roots grew. In such instances the reward in shells collected from the roots and their attachment is usually worth much unsuccessful effort.

In Monterey Bay, about a quarter of a mile off shore, extending for a stretch of two or three mailes from Del Monte toward Moss Landing, there used to be a fine bed of kelp. Unfortunately, it has been gone for many years, having been torn out completely during an unusually severe winter storm in the late 1920s. Dr. Harold Heath of Pacific Grove, once said that after this storm the kelp was piled six and eight feet deep on the Del Monte Beach. What a marvelous opportunity for any shell collector who may have been there at the time. The destruction of this bed was a real loss from the collectors standpoint as it was the habitat of the finest specimens of Calliostoma and Tegula that have been taken from the Bay. In addition, it was a prolific area for shallow dredging, which always produced good results.

In June,1922, while hopefully hauling on kelp stems to break one of the roots from its fastenings, one finally gave way and was brought to the surface from a depth of about ten fathoms. It proved to be an unusually large and complete one, with a widespread tangle of roots nearly four feet in diameter and two or three feet thick. Along with the roots came several slabs and many shattered fragments of shale. When cut from the stems this holdfast almost completely filled the small row-boat, so it was taken ashore and thoroughly searched for shells. The haul proved to be so rich that a record was kept, which came to a total of 53 species and about 440 specimens. The list follows:

Pelecypods- Lima dehiscens Conrad- 1 juv.; Lithophaga plumula (Hanley) - 1 valve; Lucina annulata Reeve- 1 juv.;Nuculana penderi (Dall)- 1 valve and 2 juv.; Nuculana taphria (Dall)- 1 juv.; Pecten hastatus Sowerby-1 juv.; Petricola carditoides (Conrad)- 1 juv.; Philobrya setosa (Carpenter)-1; Psephidia salmonea (Carpenter)-1; Rochefortia aleutica (Dall)-2; Saxicava arctica Linnaeus- 1 juv.; Volsella fornicata (Carpenter)- 1 juv;

Gastropods- Alvania acutilirata (Carpenter)-3; A. purpurea Dall-4; Amphissa reticulata Dall-22; Balcis thersites (Carpenter)-65; Balcis n. sp. -2; Bittium attenuatum Carpenter-56; B. quadrifilatum Carpenter-122; Calliostoma costatum (Martyn)-25; C. splendens Carpenter-2 (1 juv.); Crepidula adunca Sowerby- 10 juv.;C. lingulata Gould-1; C. sp. indet.-1 nuclear stage, possibly C. perforans Valenciennes; Daphnella fuscoligata Dall-2; Diaphana californica Dall-2, a new northern record; Diadora aspera (Eschscholtz) - 14 juv.; Epitonium tinctum (Carpenter)-1; Homalopoma carpenteri (Pilsbry)-112; H. paucicostatum (Dall)-25; Lacuna solidula Loven- 1; Margarites salmoneus (Carpenter)-14; Mitrella gausapata (Gould)-

(con.)

M. tuberosa (Carpenter)-4; Mitromorpha aspera (Carpenter)-4; Nassarius mendicus (Gould)-2 juv.; N. perpinguis (Hinds)-1; Ocenebra fusconotata (Dall)-4; O. interfossa Carpenter- 1 adult, 2 juv.; O. n. sp.-2; O. sp. ? - 7. Similar to O. lurida munda (Carpenter) but not this subspecies and may be new; Odostomia oldroydi Dall and Bartsch-5; O. (Evalea) sp. indet. - 1; Phasianella pulloides Carpenter- 2; Pseudomelatoma torosa (Carpenter); Puncturella cucullata (Gould0- 1; Seila montereyensis Bartsch- a fragment; Tegula pulligo (Martyn)- 1 juv.; Turbonilla serrae Dall and Bartsch-1; Turcica caffea Gabb-1.

Chitons- Lepidochitona species ? - 1; Ischnochiton mertensii (Midd.) 1 intermediate valve; I. species ? - 1 too young to determine.

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Additions and Corrections

The following data was submitted by Mr. E.P. Chace following the club discussion at the April meeting.

" Margarites optabilis- range Monterey to San Diego
Megathura crenulata- add Santa Cruz, Calif. (Turver)
Fissurella virescens- Tremper had one specimen taken at San Pedro(Strong)
Diadora aspera and D. densiclathrata are distinctly different based on anatomical work (Strong);
Fissurella volcano- Crescent City record needs confirming.

The following data has been submitted by Mr. Morris Caruthers:

Calliostoma supragranosum- Laguna Beach (plentiful);San Pedro breakwater; White's Point, San Pedro.
Calliostoma costatum- Cayucos; Piedras Blancas.
Calliostoma annulatum- Puget Sound; Morro Bay (one living specimen); Monterey.
Calliostoma canaliculatum- Laguna Beach (not rare); Morro Bay (inside); Monterey.
Calliostoma gemmulatum- Morro Bay (inside); Cayucos; Laguna Beach (not rare).
Calliostoma tricolor- Laguna Beach (small specimens); Morro Bay(inside).
Calliostoma gloriosum- Morro Bay (two large specimens); Corona del Mar.'

The following data has been submitted by W.J. Eyerdam:

Haliotis kamtschatkana Jonas,1845- Type locality: Unalaska, Kamchatka Sea (I presume that was the old Russian name for Bering Sea.). " I am rather skeptical about the Unalaska record as type locality, but it may be correct. Ask Bartsch whether there are any specimens in the National Museum from the Gulf of Alaska or the Aleutian Islands. I know that they are quite common on the outer coasts of some of the S.E. Alaska islands and W. Washington Island. The following were collected by Eyerdam and are all quite similar: Craig, Prince of Wales Island, and Baranof Island, S.E. Alaska and Hakodate, Japan.

Fissurella virescens Sowerby,1835- Mazatlan, Mexico and Corinto,Nicaragua Collected by Eyerdam, 1938 and 1939.

Diadora inaequalis Sowerby,1835- Mazatlan,Mexico; Corinto, Nicaragua; Gulf of Fonseca, Honduras, and Talara,Peru- Eyerdam,1938 and 1939. Extended range southward from Ecuador.

Diadora aspera Eschscholtz,1833- Rosario Beach, Skagit Co.,; San Juan Islands; Port Orchard, Kitsap Co.; Clallam Bay, Clallam Co., Wash. " The specimens collected at Rosario Beach were taken from rocks at night time. About two dozen of them supported a commensal wormHalosydna lordi Baird about 2 inches long under the mantle of the shell. These worms belong to the family Polynoideae and are also sometimes to be found in the gill groove

(con.)

of the giant Chiton Cryptochiton stelleri.

Puncturella major Dall,1891- Strait of Fuca (Eyerdam).

Puncturella galeata Gould,1846- Izhut Bay, Afognak Island; Drier Bay, Knight Island, Alaska; and Strait of Fuca (Eyerdam); also Hinchinbrook Island, Alaska (Norberg).

Puncturella eyerdami Dall,1924- Only known from the two type specimens at the National Museum- collected by Eyerdam in 1923 in 15 fms. shell and mud at Drier Bay, Knight Island, Alaska. A distinct species which should be figured.

Puncturella cucullata Gould,1846- Sitkalidak Island, Izhut Bay, Afognak Island; Drier Bay, Knight Island; and Strait of Fuca (Eyerdam); and Hinch--inbrook Island, Alaska (Norberg).

Puncturella multistriata Dall- Seymour Narrows, B.C.; San Juan Island;l and Strait of Fuca, Wash. (Eyerdam).

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W.J. Eyerdam* " A fellow that worked with me last summer did quite a lot of diving for abalones in Half Moon Bay. He claimed to have taken Haliotis rufescens with the animal 18 inches across. Do they really get that big or did he get his figures mixed up ?"

* Editorial note*- Your editor sampled the stuff in that Half Moon Bay tavern one time and it didnt seem to effect him that way. But just the same it will be appreciated if someone will advise us if they know about the dimentions of the largest specimen of rufescens on record. But an 18 inch one would be a shell collection in itself.

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H. Groendyle, Bi Idtschestraat 15, Leenwarden, Holland. " I should very much appreciate it if you would like to exchange your duplicate shells with me. We have here in Leenwarden (Frierland- Holland) a museum for natural history, for which institution I am collecting shells. At present I have the following list of duplicates for exchange. I hope I'll soon be able to give a more detailed list. If you should happen to have more specified wishes please write."

Max G. Hammerschlag, 325 Grove Road, South Orange, New Jersey. wishes to purchase specimens of Trophon triangulatus and Murex scorpio. I have no doubt but that the shell he wishes is the species we now call Forreria catalinensis Oldroyd rather than the small species we now call Trophon triangulatus,

Mrs. Witherspoon, 462 Shady Ave., Sharon, Pa. is interested in purchasing shells.

Keith A. Yenne, 37 Prentiss St., Cambridge 40, Mass. asks to purchase a copy of our Illustrated Glossary.

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Ward's Natural Science Establishment Inc., P.O. Box 24, Rochester 9, N.Y. This firm wishes to purchase a number of the Ischnochiton conspicuous complete with the animal preserved in alcohol- a hundred or several hundred. They are also interested in a quantity of any species of Dentalium also preserved in alcohol with the animals complete.

Perhaps some of the members may be interested in collecting these for them.

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Minutes of the Conchological Club of Southern California- May,1946

The Conchological Club of Southern California met as usual, May 7, 1946. The meeting was called to order by the president. There were 20 members and three visitors present. The visitors were Mrs. Mary Wright, mother of Dr. Wright, Nettie B. Waut, 1119 Arapahoe, a guest of Mrs. Bagley, and C.O. Reis, 646 Juanita Ave., Los Angeles, who expressed a desire to become a member of the club. A long absent member, H. Carroll McGowan, now living at Santa Barbara and who was in the city on business, was present for the first time in several years. There were no reports of standing committees so the scheduled subject for the evening " Collecting Marine Shells at Guaymas, Mexico" was taken up first by Mr. Harry Turver who enumerated the things that should be provided for a trip of that time, how and where to get passports, the things that could be obtained there, health precautions, estimated expenses and weather and road hazzards. He described the nature and extent of collecting grounds there and on the way, and gave an interesting account of the people and their general welcoming of travellers as well as some of the things they rightfully resented at the hands of thoughtless strangers.

Mrs. Turver followed giving a very interesting account of a trip that she and two friends took to Guadalahara, the second city of Mexico. The distance was considerable, the accomodations far from adequate, and the delays tedious. On their arrival, in the midst of a fiesta, they found themselves very much jammed in the crowds attending a political gathering. They heard a speech by the governor which she declined to repeat to us, it being, of course, in Spanish. They witnessed a lengthy parade either drawn by all kinds of animals or bearing them on their backs. She brought many snapshots and a box of their most interesting ' finds' as well as a gift box of duplicates.

Their combined reports gave us a better understanding of what to do and what to expect in the way of enjoyment and of materials to be found.

An exhibit of the Lapidary Club was in the main building and on invitation, the club adjourned to attend it. We found it extensive and most beautiful. Effie M. Clark, Secretary.

Copy of Attendance Register- May 7,1946

Mr.and Mrs. Gillis, 1904 N. Madison Ave., Pasadena 6.
George P. Kanakoff, Los Angeles Museum, Exposition Park, Los Angeles
William Rudox
Albert D. Howard, 2307 W. 20th St., Los Angeles
Mr.and Mrs. E.P. Chace, Lomita, Calif.
Dr. Charles R. Wright, 601 O. St., Sanger, Calif. Ph. 348 W.
Mrs. Mary A. Wright, 410 N. El Molino, Pasadena.
Harry R. Turver and Mary E. Turver, 8640 Evergreen Ave., Southgate, Calif
Nettie B. Waut, 1119 Arapahoe St., Fi. 8051
Laura B. Bagley
H. Carroll McGowan, 4277 Hollister Ave., Santa Barbara, Calif.Ph. 24623
Morris E. Caruthers, 120 E. Chesthut St., Glendale, Calif.
A. Baughman
Dr. and Mrs. Howard R. Hill, Los Angeles Museum.
C.O. Reis 646 Juanita Ave., Los Angeles 4
Mr.and Mrs. E.P. Baker, Downey, Calif.
Arthur C. Price 2618 Wellington Rd.,
Effie M. Clark.

*** The editor wished to thank those who have been contributing to our fund. It seems logical to assume that those on our mailing list who have not done so are not interested and those names will be dropped after this issue. It has been just a year since we first asked for yearly contributions. Our publishing fund is again exhausted. The plans are for another large number covering the Turridae to be followed by another on the Chitons. We then expect to publish a complete index of everything covered in the Minutes to date. This is being prepared by Mrs. Thomas A. Burch and will be somewhat voluminous. ***

We have received a number of requests for our Illustrated Glossary from outsiders. It seems that we should receive at least one dollar to our fund for additional copies of this paper. We still have some stock of our bound report on the Pelecypoda for which we have been getting $5.00.

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7.30 P.M. at the Los Angeles Museum, Exposition park, Los Angeles, Calif.

Please mail all shell news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965.

The editor is again at home after an extensive business trip to San Francisco during which time these papers were badly neglected.

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Dr. A. Myra Keen, Box 1563, Stanford University, Calif.

"I have just noted an oversight on my part in connection with Margarites cinereus (Couthouy). Rehder has shown (Proc. Biol. Soc. Washington, vol. 50, pp. 115, 1937) that this is a homonym and that the first available name is Margarites costalis (Gould), 1841, ex Loven MS. The reference for this is Gould, " Invertebrata of Massachusetts", p. 252.

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The program committee of the Conchological Club of Southern California has announced the following special papers.

June- Chitons of Australia by E.P. Chace
July- Cones of the West Coast of America by A.M. Strong
August- Pectinidae by M. Caruthers
September- Land Snails of the Channel Island by G. Kanakoff.

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Family Pyramidellidae

We have the following letter from Mr. A.M. Strong and for convenience will run all of his keys first and then take up the discussion of the various species involved.

" I am inclosing copies of the keys to the principal subgenera in Turbonilla and Odostomia. These include all species that occur north of San Diego. I hope I have not ommited any.

In the subgenera where there are only one to four or five species in our list it hardly seems worth while to make out keys. However, if you think it best to have them to fill out the complete list it will be easy to make out such keys."

Turbonilla

Whorls with a low, rounded cord at the periphery..........gilli D. & B.
Length 3.3 mm. Monterey to San Diego Bull. 68-29, 2-3
Whorls without a cord at the periphery
. Whorls overhanging ....diegensis D. & B.
Length 5.3 mm. San Pedro to San Diego Bull. 68-31, 2-13
. Whorls not overhanging .... acra D. & B.
Length 10 mm. Off Catalina Island Bull. 68-32, 2-14

Chemnitzia

Adult large, more than 7 mm. in length
. Whorls well rounded .... hypolispa D. & B.
Length 8.1 mm. Catalina to San Diego Bull. 68-34, 2-5
. Whorls flattened ....gibbiana Cooper
Length 10 mm. Monterey Bull 68-35
Adult smaller, less than 7 mm. in length
. Summit of whorls tabulated .... aepynota D. & B.
Length 3.2 mm. San Pedro to San Martin Island Bull. 68-35,2-10
. Summit of whorls not tabulated
.. Intercostal spaces terminating posterior to the suture
... Axial ribs weak on the last whorl...............santarosana D. & B.
Length 4.5 mm. Santa Rosa Island Bull. 68-36, 2-7
... Axial ribs strong on all whorls
.... Axial ribs on last whorl 16 ....engbergi Bartsch
Length 3.7 mm. Gulf of Georgia Proc. 70-5, 1-4
.... Axial ribs on last whorl 18 ....clarinda Bartsch
Length 4.7 mm. San Diego Proc. 42-264, 35-4
.. Intercostal spaces extending to the sutures
... Whorls narrowly shouldered at the summit
.... Axial ribs vertical .... .muricatoides D. & B.
Length 3.0 mm. Monterey Bull. 68-38, 2-11
.... Axial ribs protractive .... kelseyi D. & B.
Length 4.7 mm. Santa Barbara to San Ignacio Bull. 68-39, 2-11
... Whorls almost appressed to the summit .... raymondi D. & B.
Length 5.2 mm. Santa Rosa Island to San Diego Bull. 68-39, 2-17

Strioturbonilla
Point Conception to San Diego
Intercostal spaces terminating posterior to the suture
. Intercostal spaces pinches in anterior to the suture ..dinora Bartsch
Length 9.2 mm. San Diego Proc. 42-264,35-8
. Intercostal spaces not pinched in anterior to the suture
.. Axial ribs exceedingly protractive................. buttoni D. & B.
Length 6.3 mm. Santa Rosa Island to Gulf of Calif. Bull.68-43,3-4
.. Axial ribs moderately protractive
... Whorls overhanging..................................asser D. & B.
Length 8.3 mm. Redondo to San Diego Bull. 68-45, 3-1
... Whorls not overhanging
.... Axial ribs obsolete on the body whorl............ attrita D. & B.
Length 7.4 mm. San Pedro to San Diego Bull. 68-46, 4-11
.... Axial ribs passing feebly over the periphery .....encella Bartsch
Length 4.5 mm. San Pedro Proc. 42-265, 35-1
.... Axial ribs well developed
..... Whorls slightly rounded, narrowly shouldered... bakeri Bartsch
Length 8.0 mm. San Diego Proc. 42-265,35-10
..... Whorls well rounded, not shouldered ....torquata Gould
Length 6.5 mm. San Pedro to San Diego Bull. 68-47, 4-15
.. Axial ribs vertical
... Axial ribs much enfeebled on the last whorl,,,,,carpenteri D. & B.
Length 7.9 mm. San Pedro Bull. 6849,3-9
... Axial ribs strong on all whorls
.... Axial ribs 16 on the body whorl.................. stimpsoni D. & B.
Length 6.7 mm. Redondo to San Diego Bull. 68-49, 3-11
.... Axial ribs 22 on the body whorl ....profundicola D. & B.
Length 6.3 mm. Off Catalina to off San Diego Bull.68-80,3-11
Intercostal spaces extending to the sutures.
. Shell broadly conic
.. Axial ribs on body whorl 20 ....humerosa D. & B.
Length 6.0 mm. Catalina to San Diego. Bull. 68-52, 3-10
.. Axial ribs on the body whorl 28 ....gallianoi D. & B.
Length 6.1 mm. San Diego to off Cape San Lucas Bull.68-51,4-12
. Shell slenderly conic
.. Periphery feebly angulated ....aresta D. & B.
Length 6.4 mm. Santa Rosa Island to San Diego Bull. 68-54, 4-5
.. Periphery and base well rounded.................. dracona Bartsch
Length 6.9 mm. San Diego Proc. 42-266, 35-2
North of Point Conception
Intercostal spaces terminating posterior to the sutures
. Axial ribs moderately protractive
.. Whorls overhanging ....vancouverensis D. & B.
Length 6.0 mm. Alaska to British Columbia Bull. 68-44, 4-9
.. Whorls not overhanging
... Whorls well rounded
.... Periphery and base well rounded ....stylina Carpenter
Length 6.5 mm. Monterey Bull.68-48,3-7
.... Periphery ontusely angulated ....barkleyensis Bartsch
Length 9.2 mm. Vancouver Island Proc. 52-641,44-9
... Whorls almost flattened .... canadensis Bartsch
Length 6.3 mm. Forrester Island Proc. 52-640,44-11
(con.)

. Axial ribs slightly retractive ....kincaidi Bartsch
Length 5.5 mm. Puget Sound Proc. 70-5,1-3
Intercostal spaces extending to the sutures .... serrae D. & B.
Length 7.7 mm. Monterey Bull. 68-53, 4-3

Pyrgolampros
San Diego to Point Conception
Axial ribs poorly developed, obsolete on the last whorl ..halistrepta D. & B
Length 9.5 mm. Off Newport Bull. 68-72, 5-2
Axial ribs distinct on all whorls
. Shell short and stout ....ridgwayi D. & B.
Length 4.6 mm. San Diego Bull. 68-62, 6-10
. Shell elongate-conic
.. Shell unicolor
... Whorls well rounded ....lowei D. & B.
Length 7.2 San Pedro to San Diego Bull. 68-64, 6-11
... Whorls flattened on the sides
.... Ribs decidedly retractive ....tremperi Bartsch
Length 4.7 mm. San Diego Proc. 52-647, 44-7
.... Ribs vertical or slightly retractive
..... Ribs about 16 on the last whorl ....halibrecta D. & B.
Length 6.2 mm. Catalina Island Bull. 68-65, 5-10
..... Ribs 22 or more on the last whorl
...... Ribs weak, rounded .... gouldi D. & B.
Length 5.8 mm. Santa Rosa Island to San Diego Bull.68-66, 6-1
...... Ribs strong
.... Periphery well rounded ....ilfa Bartsch
Length 10.5 mm. San Pedro Proc. 70-7, 1-1
.... Periphery obtusely angulated .... strongi Willett
Length 6.8 mm. Catalina Nautilus 45-67
.. Shell not unicolor
... Colors in two zones .... pedroana D. & B.
Length 7.0 mm. San Pedro to San Diego Bull. 68-67, 6-12
... Colors banded
.... Bands only visible on the outer lip............. chocolata Carpenter
Length 14.0 mm. San Pedro Bull. 68-70, 5-9
.... Bands visible on the spire and base
..... A single broad band covering the periphery
...... Axial ribs strongly retractive ....gloriosa Bartsch
Length 8.3 mm. San Diego Proc. 42-268, 35-9
...... Axial ribs slightly protractive.................halia D. & B.
Length 8.5 mm. Santa Barbara to San Pedro Bull. 68-68, 6-6
..... Color bands double ....berryi D. & B.
Length 8.0 mm. Monterey to Catalina Bull. 68-69, 5-5
..... Color bands triple
...... Ribs about 22 on the last whorl.................. painei D. & B.
Length 7.3 mm. Catalina to San Diego Bull. 68-71, 5-4
...... Ribs about 30 on the last whorl .... keepi D. & B.
Length 11.7 mm. Catalina to San Diego Bull. 68-71, 5-1
Point Conception to Alaska
Axial ribs poorly developed, faint or obsolete on the last whorl
. Axial ribs reduced to mere lines of growth .... oregonensis D. & B.
Length 8.5 mm. Oregon and Washington Bull. 68-73, 5-5

(con.)

. Axial ribs more than mere lines of growth
.. Shell over 11 mm. long..............................lituyana D. & B.
Length 11.5 mm. Lituya Bay, Alaska Bull. 68-73, 5-8
.. Shell less than 9 mm. long
... Axial ribs retractive..............................rinella D. & B.
Length 8.5 mm. British Columbia Proc. 42-270,35-6
... Axial ribs vertical or nearly so
.... Flesh colored with a darker band ....franciscana Bartsch
Length 6.8 mm. San Francisco Bay Proc. 52-695, 42-2
.... Chestnut with a paler band ....peasa D. & B.
Length 6 mm. British Columbia Proc. 42-269,35-5
Axial ribs distinct on all whorls
. Shell short and stout
.. Shell unicolor
... Whorls excurved at the summit.......................victoriana D. & B.
Length 5.6 mm. British Columbia Bull. 68-61, 5-3
... Whorls not excurved at the summit...................valdezi D. & B.
Length 5.6 mm. Monterey Bull. 68-62,6-8
.. Shell banded ....newcombei D. & B.
Length 5.4 mm. British Columbia Bull. 68-63, 6-3
. Shell elongate conic
.. Shell unicolor ....taylori D. & B.
Length 6.5 mm. British Columbia Bull. 68-64, 6-7
.. Shell not unicolor
... Shell bicolor
.... Axial ribs 18 on the body whorl .... talma Bartsch
Length 9 mm. British Columbia Proc. 42-267, 35-7
.... Axial ribs 22 on the body whorl .... aurantia Carpenter
Length 5.8 mm. British Columbia Bull. 68-64, 6-4
... Shell banded
.... Band single, broad
..... Shell over 8 mm. in length
...... Axial ribs 18 on the last whorl .... stelleri Bartsch
Length 8.3 mm. Alaska Proc. 70-6, 2-4
...... Axial ribs 30 on the last whorl .... eyerdami Bartsch
10.5 mm. Alaska Proc. 70-9, 2-12
..... Shell less than 7 mm. in length
...... Axial ribs retractive.............................lyalli D. & B.
Length 5-7 British Columbia Bull. 68-68,6-6
...... Axial ribs vertical or slightly protractive
.... Axial ribs 24 on the last whorl ....middendorffi Bartsch
Length 6.4 mm. Alaska Proc. 70-8, 2-2
.... Axial ribs 18 on the last whorl
.... Axial ribs curved ....shuyakensis Bartsch
Length 6.3 mm. Alaska Proc. 70-7, 2-1
.... Axial ribs straight
.... Axial ribs expanded at the suture............pugetensis Bartsch
Length 4.0 mm. Seattle, Wash. Proc. 52-647, 44-4
.... Axial ribs not expanded at suture ....skogsbergi Strong
Nautilus 51-54
.... Band double.. alaskana D. & B.
Length 8.0 mm. Alaska Bull. 68-70, 6-9
.... Bands triple .... macouni D. & B.
Length 9 mm. British Columbia Proc. 42-268, 35-11

Pyrgiscus
San Diego and North

Axial ribs terminating anterior to the umbilical region
. Axial ribs terminating abruptly at the periphery
.. Shell broadly conic
... Incised spirals 6, of uniform strength........... vexativa D. & B.
Length 6.2 mm. San Pedro Bull. 68-77, 7-11
... Incised spirals 7, not uniform...................obesa D. & B.
Length 5.2 mm. Pacific Beach Bull. 68-78, 7-3
.. Shell elongate conic
... Shell large, adult over 12 mm. long
.... Summit of whorls narrowly shouldered .... nuttingi D. & B.
Length 12.3 mm. San Pedro to San Diego Bull. 68-79, 7-13
.... Summit of whorls appressed .... dora Bartsch
Length 13.8 mm. San Diego Proc. 52-649, 42-10
... Shell smaller, adult less than 5 mm. long ....callia D. & B.
Length 4.7 mm. San Diego Bull. 68-80, 7-4
. Axial ribs fading out before the middle of the base
.. Shell stout and very robust
... Axial ribs somewhat tuberculated ....pluto D. and B.
Length 7.5 mm. San Pedro Bull. 68-81, 9-9
... Axial ribs not tuberculated ....jewetti D & B
Length 5.5 mm. San Pedro to San Hipolito Point Bull. 68-82,7-2
.. Shell not stout and very robust
... Shell broadly conic
.... Incised lines of uniform strength
..... Shell large, adult more than 10 mm. long ....signae D. & B.
Length 10.2 mm. San Pedro Bull. 68-83, 7-1
..... Shell smaller, less than 7 mm. long
...... Base with incised spiral lines only
.... Axial ribs 20 on the last whorl...............morchi D. & B.
Length 6.4 mm. Catalina to San Diego Bull. 68-84, 7-6
.... Axial ribs 30 on the last whorl ....aragoni D. & B.
Length 7.0 mm. Monterey Bull. 68-85, 9-12
...... Base with incised spiral lines and fine striations..recta D. & B.
Length 3.6 mm. San Diego to Pt. Abreojos Bull. 68-85,7-12
.... Incised spiral lines not of uniform strength
..... Incised spirals all strong
...... Axial ribs 18 on the last whorl.................nereia D & B
Length 5.8 mm. San Pedro to San Diego Bull. 68-86, 8-11
...... Axial ribs 35 on the last whorl .... weldi D & B
Length 8.8 mm. San Pedro Bull. 68-86, 8-11
..... Incised spiral lines partly strong, partly fine
...... Shell large, adult more than 12 mm. long....... ista Bartsch
Length 12.5 mm. San Diego Proc. 52-650, 42-6
...... Shell smaller, less than 7 mm. long
.... Periphery and base well rounded .... eva Bartsch
Length 4.3 mm. San Diego Proc. 52-651, 44-5
.... Periphery angulated, base short
.... Axial ribs 22 on the last whorl
.... Whorls overhanging ....antemunda D & B
Length 6.9 mm. Santa Rosa to Catalina Island Bull.68-88,8-15
.... Whorls not overhanging .... ina Bartsch
Length 6.1 mm. San Diego Proc. 52-649, 44-10

.... Axial ribs 28 on the last whorl .... antestriata D & B
Length 9.7 mm. Esteros Bay to San Diego Bull.68-87,8-5

... Shell elongate-conic
.... Incised spirals all strong
..... Summit of whorls exserted .... tenuicula Gould
Length 7.5 mm. Monterey to Pt. Abreojos Bull.68-92,8-7
..... summit of whorls not exserted
...... Spacing of incised spirals regular .... virgo Carpenter
Length 4.8 mm. Santa Barbara Bull. 68-93, 8-4
...... Spacing of incised spirals not regular
.... Whorls flattened on the sides .... canfieldi D & B
Length 6.3 Monterey Bull. 68-95, 9-3
.... Whorls rounded
.... Whorls shouldered at the summit ....callimene Bartsch
Length 7.2 San Diego Proc. 42-271, 37-7
.... Whorls appressed at the summit ....almo D. & B.
Length 4.6 mm. San Diego Bull. 68-95, 9-8
.... Incised spirals not all strong
..... Summit of whorls exserted ....tenuicula Gould
Length 7.5 mm. Monterey to Pt. Sbreojos Bull. 68-92,8-7
..... Summit of whorls not exserted ....eucosmobasis D. & B.
Length 11.2 mm. San Luis Obispo to Santa Rosa Isl. Bull.68-98,10-11

Axial ribs extending to the umbilical region
. Base of last whorl decidedly inflated
.. Shell large, adult more than 10 mm. long .... castanea Keep
Length 10.5 mm. San Pedro to San Diego Bull. 68-100, 9-1
.. Shell smaller, adult less than 8 mm. long .... aurecoma D. & B.
Length 7.2 mm. San Pedro to Scammons Lagoon Bull. 68-101, 9-5
. Base of body whorl not inflated
.. Shell broadly conic
... Whorls shouldered at the summit .... adusta D. & B.
Length 5.7 mm. San Diego Bull. 68-108, 10-12
... Whorls not shouldered at the summit
.... Axial ribs broad and flattened .... castanella D. & B.
Length 13.5 mm. Monterey Bull. 68-102, 9-7
.... Axial ribs rounded, distinct .... burchi Gordon
Length 10.4 mm. Redondo Beach Nautilus 51-49
.. Shell elongate-conic
... Whorls narrowly shouldered at the summit .... delmontensis Bartsch
Length 9.7 Del Monte Proc. 70-9, 2-11
... Whorls slopingly shouldered on upper part
.... Shell milk white .... wickhami D. & B.
Length 8.0 mm. Catalina Island Bull. 68-106, 10-9
.... Shell golden brown ....grippi Bartsch
Length 11.00 mm. San Diego Proc. 42- 270, 36-9

Mormula
San Diego to Alaska

Varices present on the outside of the whorls
. Adult large, more than 13 mm. long
.. Shell conspicuously banded ....lordi E.A. Smith
Length 20.8 mm. Sitka to Puget Sound Bull. 68-111, 11-4
.. Shell not conspicuously banded
... Incised spiral lines 6 between the sutures .....regina D. & B.
Length 19.6 mm. Santa Rosa Isl. to San Pedro Bull. 68-112,11-1

... Incised spiral lines between the sutures more than 6
.... Incised spiral lines between the sutures 9.....catalinensis D. & B.
Length 16.5 mm. Catalina Island Bull. 68-113,11-10
.... Incised spiral lines 12 between the sutures.....eschscholizi D & B
Length 13.3 British Columbia Bull. 68-113,11-8
. Adult smaller, less than 12 mm. long
.. Incised spiral lines 5 or 6 between the sutures
... Periphery of the last whorl angulated .... tridentata Carpenter
Length 11.2 mm. Monterey to San Diego Bull. 68-114, 11-12
... periphery of last whorl rounded ....clementina Bartsch
Length 7.6 mm. San Clemente Island Proc. 70-11, 2-9
.. Incised spiral lines 10 between the sutures ..... ambusta D. & B.
Length 10.0 mm. San Pedro Bull. 68-115, 11-13
varices absent from the soutside of the whorls
. Adult shell more than 11 mm. long ....enna Bartsch
Length 11.6 mm. San Pedro Proc. 70-10, 2-8
. Adult shell less than 10 mm. long
.. Adult shell more than 8 mm. long ....pentalopha D. & B.
Length 8.5 mm. San Pedro to Todos Santos Bay Bull. 68-117, 11-3
.. Adult less than 6 mm. long
... Axial ribs 28 on the last whorl ....heterolopha D. & B.
Length 5.5 mm. San Pedro to San Hipolito Pt. Bull. 68-118,11-9
... Axial ribs 14 on the last whorl ....periscelida D & B
Length 3.2 mm. Santa Rosa Island Bull. 68-119, 11-6

Chrysallida

Point Conception to San Diego

All spiral cords nodulous
. Sutures strongly channeled
.. Shell elongate-conic, slender
... Basal cords 4 ....heterocincta Bartsch
Length 3.2 mm. San Diego Proc. 42-274
... basal cords 5 ....eugene D & B
Length 4.3 mm. San Pedro to San Hipolito Pt. Bull 68-166
... basal cords 6 ....ritteri D & B
Length 4.5 mm. Catalina to San Diego Bull. 68-146
... Basal cords 8 ....trempori Bartsch
Length 3.7 mm. San Clemente Island Proc. 70-14
.. shell broadly conic or ovate
... basal cords 4 .... trachis D & B
Length 2.5 mm. Monterey to San Diego Bull. 68-148
... basal cords 5
.... Shell large, adult 4 mm. long .... lucca D & B
Length 4 mm. Monterey to San Diego Bull. 68-148
.... Shell small, adult 2.3 mm. long ....clementina D. & B.
Length 2.3 mm. San Clemente Island Bull. 68-157
... Basal cords 6
.... Whorls slopingly shouldered ....oldroydi D & B
Length 3.5 mm. San Diego to Coronado Ids. Bull. 68-150
.... Whorls not shouldered ....cincta D & B
Length 3.0 mm. Santa Barbara to Pacific Beach Bull. 68-156

... Basal cords 7 ....vicola D & B
Length 2.5 mm. San Pedro Bull. 68-153
. Sutures not channeled
.. Spiral cords between sutures 4
... Basal cords 6 .... pulcia D & B
Length 2.2 mm. San Pedro Bull. 68-160
... Basal cords 10 or more ....virginalis D & B
Length 3.0 mm. San Pedro to Pt. Abreojos Bull. 68,-160
.. spiral cords between sutures more than 4
... Axial ribs about 20 ....clementensis Bartsch
Length 3.2 mm. San Clemente Island Proc. 70-15
... Axial ribs about 30 ....thalia Bartsch
Length 2.0 mm. Coronado Islands Proc. 42-275
All spiral cords not nodulous
. Anterior spiral cord smooth, rest nodulous
.. Shell large, adult 5 mm. in length ....pulcherrima D & B
Length 5 mm. San Pedro Bull. 68-169
. Anterior spiral cord smooth, rest nodulous
.. Shell small, 3 mm. or less in length
... Basal cords 5....................................vincta D & B
Length 2.7 mm. San Pedro Bull. 68-165
... Basal cords 7 ....catalinensis Bartsch
Length 3.1 mm. Catalina Island Proc. 70-17
. More than one cord smooth
.. Spiral cord between sutures 4
... shell large, more than 4 mm. in length ....helga D & B
Length 4.2 mm. San Pedro to Coronado Islands Bull. 68-166
... shell small, adult less than 3.5 mm. in length ...dinella Bartsch
Length 3.0 mm. San Diego Proc. 42-274
.. Spiral cords between sutures more than 4.
... shell elongate conic, slender ....virginalis D & B
Length 3.0 mm. San Pedro to Point Abreojos Bull. 68-160
... shell ovate ....sapia D & B
Length 1.8 mm. San Diego Bull 68-167

Chrysallida- North of Point Conception

All spiral cords nodulous
. Sutures strongly channeled
.. Basal cords 4 .... trachis D & B
Length 2.5 mm. Monterey to San Diego Bull. 68-148
.. Basal cords 5
... Whorls slopingly shouldered........................lucca D & B
Length 4 mm. Monterey to San Diego Bull. 68-148
... Whorls not shouldered ....chacei Bartsch
Length 2.9 mm. Monterey to Cayucos Proc. 70-16
.. Basal cords 7
... Anterior spiral cord the strongest ....euglypta Jordan
Length 2.1 mm. Trinidad Proc. 58-2
... All spiral cords equal in strength .... astricta D & B
Length 2.9 mm. Monterey to San Diego Bull. 68-154
.. Basal cords 8 ....cooperi D & B
Length 3.1 mm. Monterey Bull 68-159

(con.)

. Sutures not channeled
.. Spiral cords between the sutures 4
... Posterior spiral cord the weakest............cumshewaensis Bartsch
Length 2.7 mm. British Columbia Proc. 70-13
... All spiral cords equal in strength ....montereyensis D. & B.
Length 3 mm Monterey Bull. 68-159
.. spiral cords between the sutures more than 4 ...oregonensis D & B
Length 3.3 mm. B.C. to Monterey Bull. 68-162

Menestho- San Diego to Alaska

Shell elongate-conic ....pharcida D & B
Length 2.2 mm. British Columbia Bull. 68-185,21-5
shell elongate- ovate or ovate
. Last whorl with about 40 spiral cords ....exarta D & B
Length 3.9 mm. Monterey Bull. 68-186,21-1
. Last whorl with much less than 40 spiral cords
.. Spiral cords 3 between the sutures ....gloriosa Bartsch
Length 3.1 mm. San Diego to San Hipolito Pt. Proc. 42-276,36-2
.. spiral cords more than 3 between the sutures
... spiral cords 4 between the sutures
.... Basal cords 3 ....amilda D & B
Length 2.6 mm. San Diego to Round Island Bull. 68-186,21-4
.... Basal cords more than 3
..... Basal cords 4
...... Spiral sculpture very strong ....farma D & B
Length 2.4 mm. Catalina Island Bull. 68-188,20-1
...... Spiral sculpture very feeble ....enora D & B
.... Basal cords more than 4
..... Spiral cords equally spaced ....fetella D & B
Length 4.4 mm. San Pedro to San Ignacio Lagoon Bull. 68-189,21-9
..... Spiral cords unequally spaced ....excisa Bartsch
Length 3.9 mm. Catalina Island Proc. 42.276, 36-8
.... Spiral cords 6 between the sutures
..... Basal cords 5 ....hapocurta D & B
Length 4.3 mm. Alaska Bull. 68-190, 21-8
..... Basal cords 8 ....harfordensis D & B
Length 3.2 mm. Port Harford Bull. 68-191, 21-3

Amaura- San Diego to Alaska

shell umbilicated
. Shell very large, adult over 10 mm. long
.. Shell very elongate-ovate ....lastra D & B
Length 13.6 mm. Catalina to San Diego Bull. 68-219,28-7
.. shell broadly ovate ....kennerleyi D & B
Length 10.2 British Columbia Bull 68-219,28-8
. shell smaller, adult less than 10 mm. long
.. Shell ovate
... Summit of whorls concavely shouldered ....elsa D & B
Length 6.1 mm. Alaska Bull. 68-220, 29-1
... Summit of whorls flatly shouldered
.... Shell widely umbilicated ....beringi Dall
Length 5.7 mm. Alaska Bull. 68-220, 27-8

.... shell very narriwly umbilicated................subglobosa Bartsch
Length 6.0 mm. San Diego Proc. 42-286,37-2
.. shell elongate-ovate
... umbilicus wide, open
.... summit of whorls tabulatedly shouldered ......farallonensis D.& B.
Length 5.5 mm. Off Farallones Bull 68-221,27-7
.... Summit of whorls faintly shouldered
..... Columella reflected over edge of umbilious ...satura Carpenter
Length 6.4 mm. Neah Bay, Wash. Bull. 68-221, 27-1
..... Columella not reflected over umbilicus ....helena Bartsch
Length 5.3 mm. San Pedro Proc. 42- 286, 38-10
... Umbilicus very narrow
.... summit of whorls appressed ....sillana D & B
Length 5.6 mm. Unalaska Bull 68-222, 28-9
.... Summit of whorls shouldered
..... Shoulder concave ....talpha D & B
Length 8.0 Mole Harbor, Alaska Bull 68-222, 27-9
..... Shoulder flat or rounded
...... Whorls strongly contracted at the suture .... krausei Clessin
Length 9.9 mm. Alaska Bull. 68-223, 29-5
...... Whorls not strongly contracted at the s uture
.... Adult shell over 9 mm. in length ....eldorana Bartsch
Length 9.1 mm. Kodiak Island, Alaska Proc. 42-287, 38-12
.... Adult shell less than 9 mm. in length
.... Surface with fine spiral lirations ....grippiana Bartsch
Length 7.5 mm. British Columbia Proc. 42-287, 38-11
.... Surface without spiral lirations
.... Columella strongly curved ....orcia D & B
Length 7.7 mm. Santa Rosa Island Bull. 68-223, 27-3
.... Columella very oblique ....gouldi Carpenter
Length 6.1 mm. Neah Bay, Wash. Bull. 68-224, 27-2
shell not umbilicated
. Shell very large, adult over 12 mm. in length ...arctica D. & B.
Length 12.4 mm. Arctic Ocean Bull 68-224,28-5
. shell smaller,adult less than 10 mm. in length
.. Shell ovate
... Summit of whorls appressed ....nuciformis Carpenter
Length 7.7 mm. Neah Bay, Wash. Bull. 68-227, 28-1
... Summit of whorls shouldered
.... Adult shell more than 6 mm. long
..... Summit of whorls with a beveled shoulder ...... canfieldi Dall
Length 9.6 mm. Monterey Bull. 68-228, 28-2
..... Summit of whorls with a tabulated shoulder ....subturrita D. & B.
Length 6.9 mm. Santa Barbara to Todos Santos Bay Bull 68-228,28-4
.... Adult shell less than 6 mm. long ....martensi D & B
Length 5.3 Alaska Bull 68-229, 29-3
.. shell elongate-ovate
... surface of shell finely spirally lirate.........moratora D & B
Length 9.5 mm. Off Point Reyes Bull. 68-225, 30-7
... surface of shell not finely lirate
.... Summit of whorls appressed...................avellana Carpenter
Length 8.3 mm. Neah Bay, Wash. Bull. 68-225,28-3

.... Summit of whorls shouldered
..... Aperture pearshaped ....illiuliukensis D & B.
Length 9.5 mm. Unalaska Bull. 68-227, 29-4
..... Aperture ovate
...... Whorls broadly shouldered ....washingtona Bartsch
Length 8.6 mm. San Juan Island, Wash. Proc. 70-20, 4-10.
...... Whorls narrowly shouldered
.... Periphery of last whorl inflated
.... Shell broadly elongate-ovate ....pasa D & B
Length 9.3 mm. Kodiak Island, Alaska Bull. 68-226,29-2
.... Shell narrowly elongate-ovate ....engbergi Bartsch
Length 7.0 mm. San Juan Island, Wash. Proc. 70-21, 5-5
.... Periphery of last whorl rounded, not inflated
.... Shell broadly elongate- ovate ....nota D & B
Length 7.5 mm. Santa Rosa Island to San Diego Bull. 68-226
.... Shell narrowly elongate-ovate ....sanjuanensis Bartsch
Length 7.2 mm Olga, Wash. Proc. 70-2-, 2-6

Odostomia, subgenus Evalea Monterey to Bering Sea
Shell umbilicated
. Spiral sculpture consisting of incised lines and raised lirations
.. Lirations confined to the base ....septentrionalis D & B
Length 4.6 mm. Unalaska Bull 68-200,26-9
.. Lirations on base and spire ....capitana D & B
Length 4.6 mm. Kodiak Island 68-200,26-7
. Spiral sculpture consisting of incised lines only
.. Columellar fold in the middle of the columella..nunivakensis D & B
Length 3.0 mm. Nunivak Island, Alaska 68-194,22-6
.. Columellar fold posterior to the middle of the columella
... Spiral sculpture strong
.... Shell thick and robust
..... Summit of whorls narrowly tabulated ....youngi D & B
Length 6.5 mm. Barkley Sound, B.C. 42-277,37-6
..... Summit of whorls not tabulated ....killisnooensis D & B
Length 6.4 mm. Killisnoo, Alaska 68-195, 22-7
.... Shell thin and delicate
..... Shell broadly tabulated at the summit......vancouverensis D & B
Length 4.7 mm. Barkley Sound, B.C. 42-280, 37-1
..... Whorls not tabulated at the summit
...... Incised lines strongest anteriorly ....spreadboroughi D & B
Length 3.3 mm. Barkley Sound, B.C. 42-279, 38-8
...... Incised lines equal on all whorls......tillamookensis D & B
Length 4.1 mm. Tillamook, Oregon 68-195, 22-2
... Spiral sculpture very fine
.... Shell very broadly conic
..... Suture strongly contracted ....aleutica D & B
Length 4.4 mm. Bering Sea to Unalaska 68-196, 22-5
..... Suture not strongly contracted
...... Whorls moderately shouldered at the summit ...quadrae Bartsch
Length 6.2 mm. Barkley Sound, B.C. 42-281, 37-3
...... Whorls not shouldered ....kadiakensis D & B
Length 5.2 mm. Kodiak Island, Alaska 68-197, 22-9

•••• Shell elongate conic
••••• Whorls narrowly tabulated at the summit
•••••• Periphery of last whorl inflated ....hypatia Bartsch
Length 5.2 mm Skidegate, Alaska 42-282,37-5
•••••• Periphery of last whorl not inflated.....cypria Bartsch
Length 4.0 mm. Skidegate, Alaska 42-282,37-7
••••• Whorls not tabulated
•••••• Periphery of last whorl subangulated
••••••• Shell narrowly elongate conic ....barkleyensis D & B
Length 3.1 mm. Barkley Sound, B.C. 42-283, 38-9
••••••• Shell very broadly elongate conic .....franciscana Bartsch
San Francisco Bay 52-665, 45-7
•••••• Periphery of last whorl well rounded
••••••• Whorls roundly shouldered ....valdezi D & B
Length 3.0 mm. Del Monte, Calif. 68-198, 23-6
••••••• Whorls not shouldered...................cookeana D & B
Length 3.2 mm. Ellamar, Alaska 42-283,37-8
Shell not umbilicated
• Incised lines strong over the entire surface
•• Periphery of last whorl subangulated ....inflata D & B
Length 6.2 mm. Neah Bay, Wash. 68-201, 23-7
•• Periphery of last whorl rounded
••• Shell elongate conic ....columbiana D & B
Length 8.3 mm. Vancouver to Port Town send 68-202,23-1
••• Shell elongate ovate ....unalaskensis D & B
Length 4.8 mm. Unalaska 68-203, 26-5
• Incised lines strong on early whorls only
•• Shell pure white, semitransparent ....phanea D & B
Length 4.8 mm. Monterey 68-204, 23-5
•• Shell not white and semitransparent
••• Periphery of last whorl rounded, inflated ....tenuisculpta Carpenter
Length 5.3 mm. Washington to Port Harford 68-206, 23-2
••• Periphery of last whorl feebly angulated .....willetti Bartsch
Length 5.8 mm. Prince of Wales Island, Alaska 52-666,43-6
• Incised spiral lines only moderately strong
•• Periphery of last whorl very strongly angulated ...angularis D & B
Length 5.6 mm. Sitka to Puget Sound 68-207, 24-6
•• Periphery of last whorl well rounded
••• Shell very broadly conic ....tacomaensis D & B
Length 4.3 mm. Tacoma, Wash. 68-209, 24-8
••• Shell elongate conic
•••• Adult shell very small ....amchitkana D & B
Length 3.5 mm. Amchitka, Alaska 68-210, 24-7
•••• Adult shell larger ....stephensi D & B
Length 5.3 mm. Baranoff Island 68-210, 24-5
••• Shell elongate ovate
•••• Whorls slightly shouldered.................eyerdami Bartsch
Length 4.5 mm. Afognak Island 70-18, 4-1
•••• Whorls not shouldered......................classini D & B
Length 6 mm. Baranoff Island 68-211,24-4
• Incised lines very fine
•• Summit of whorls tabulated ....baranoffensis D & B
Length 6.3 mm Baranoff Island 68-215, 25-3

.. Summit of whorls not tabulated
... Shell broadly conic
.... Columella almost straight ....sitkaensis D & B
Length 4.0 mm. Sitka 68-215, 26-3
.... Columella strongly curved ....hagemeisteri D & B
Length 4.4 mm. Bering Sea 68-216, 36-1
... Shell elongate ovate
.... Periphery feebly angulated ....skidegatensis D & B
Length 3.4 mm Skidegate 42-284,38-7
.... Periphery well rounded ....delicosa D & B
Length 4.0 mm. Monterey 68-216,25-3
... Shell ovate, with tabulate whorls ....cassandra D & B
Length 2.5 mm. Skidegate 42-285, 38-5

The figures under the species named refer to the Bulletin or Proceedings of the U.S. National Museum and the page. Also the plate and figure.

The following species have been reported from the Monterey area:
valdezi D & B, phanea D & B, tenuisculpta Carpenter, delicosa D & B.

Odostomia, subgenus Evalea- San Diego to Santa Barbara, Calif.
Shell umbilicated
. Spiral sculpture distinct
.. Spiral lines strong on early whorls, fading out on last..thea Bartsch
Length 4.7 mm. San Pedro 42-278,37-7
.. Spiral lines strong on all whorls
... Shoulder of whorls strongly tabulated.........calliope Bartsch
Length 4.2 mm. Off Pt. Loma, 110-100 fms. 42-278,36-10
... Shoulder of whorls not strongly tabulated
.... Shell very broadly elongate-conic ....calcarella Bartsch
Length 3.3 mm. Off Santa Rosa Island, 48 fms. 42-279,37-4
.... Shell elongate ovate.........................esilda D & B
Length 5.5 mm. Off San Diego, 359 fms. 68-196,22-1
. Spiral sculpture microscopic
.. Shell elongate conic
... Summit of whorls narrowly tabulate ....heralda D & B
Length 2.8 mm. Off San Diego 68-197,23-8
... Summit of whorls not tabulate
.... Periphery inflated, rounded
..... Whorls somewhat constricted at the summit.....callimene Bartsch
Length 3.1 mm. Off San Pedro, deep water 42-281,38-2
..... Whorls roundedly shouldered at the summit....nemo D & B
Length 4.8 mm San Pedro to San Diego 68-198,22-8
.... Periphery faintly angulated ....16 D & B
Length 5.6 mm. Santa Rosa Island
.. Shell ovate
... Summit of whorls slopingly shouldered ....pratoma D & B
Length 2.9 mm. Off Santa Rosa Island, 53 fms. 68-199,23-4
... Summit of whorls appressed ....bachia Bartsch
Length 3.6 mm. San Clemente Island 70-17, 2-7
Shell not umbilicated
. Incised lines strong on all whorls ....jewetti D & B
Length 4.1 mm. Santa Barbara 68-201,23-3

. Incised lines strong on early whorls only
.. Shell broadly ovate
... With raised lirations on the body whorl ....atossa Dall
Length 6.5 mm. San Pedro 68-203,26-8
... Without raised lirations ....obessa D & B
Length 6 mm. San Pedro 68-203, 26-4
.. Shell elongate ovate
... Shell white, semitransparent ....phanella D & B
Length 3.3 mm. San Pedro 68-205,23-9
... Shell not white and semitransparent
.... Incised lines on second whorl 15.............tenuisculpta Carpenter
Length 6.3 mm. B.C. to Catalina 68-206
.... Incised lines on second whorl 7 to 10
..... Subsutural incised lines heaviest ....whitei Bartsch
Length 2.2 mm. San Pedro 70-11-19,4-3
..... Without a heavy subsutural line
...... Body whorl with fine spiral lirations........santarosana D & B
Length 4.9 mm. Santa Rosa Island 68-205, 26-6
...... Body whorl without spiral lirations ....strongi Bartsch
Length 3.5 mm. Catalina Island 70-11-19,4-4
. Incised lines only moderately strong
.. Periphery subangulated
... Posterior angle of aperture with a weak notch...baldridgeae Bartsch
Length 5.6 mm. San Pedro 42-284,38-1
... Posterior angle of aperture without a notch
.... Adult shell 5.5 mm. long.......................donilla D & B
San Pedro to Todos Santos Bay 68-208,24-3
.... Adult shell 3 mm. long ....californica D & B
San Diego 68-208,24-2
.. Periphery of last whorl well rounded ....serilla D & B
Length 4.8 mm. Off San Diego 68-209,24-9
. Incised spiral lines exceedingly fine
.. Periphery of last whorl strongly angulated
... Shell narrowly conic ....minutissima D & B
Length 3.1 mm. San Diego to Pt. Abreojos 68-211,25-4
... Shell broadly conic.............................raymondi D & B
Length 3.6 mm. Off Catalina Island
.. Periphery of last whorl subangulated ....
... Shell large,adult more than 6.5 mm in length ....dravida Gould
Length 6.6 mm. Santa Barbara 68-212,25-7
... Shell small,adult less than 4 mm. in length
.... Shell elongate ovate
..... Summit of whorls subtabulated ....notilla D & B
Length 2.7 mm Off Catalina Island 68-213,25-6
..... Summit of whorls slopingly shouldered ....movilla D & B
Length 3.6 mm. Off San Diego, 359 fms. 68-213,25-1
.... Shell ovate ....altina D & B
Length 3.0 mm. Off San Diego, 359 fms. 68-214,24-2
.. Periphery of last whorl well rounded
... Summit of whorls tabulated....................profundicola D & B
Length 4.5 mm. Off San Diego, 359 fms. 68-214,25-8
... Summit of whorls not tabulated
.... Whorls inflated,strongly rounded .... resina D & B
Length 2.2 mm. Arch Beach 68-216, 27-6

(con.)

•••• Whorls flattened in the middle ••••••••••••••••••••nemo D & B
Length 4.8 mm. San Pedro to San Diego 68-198,22-8

Only one of these species, Odostomia (Evalea) tenuisculpta Carpenter has been reported north of Santa Barbara.

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It has been our custom to republish all descriptions since the publication of Oldroyd in order to make these papers as near a complete supplement as possible to that great work. Inasmuchas there are a number of such species in this group the descriptions will follow without regard to order. Our discussions will follow with references back to these descriptions.

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Turbonilla (Striotusbonilla) cayucosensis Willett,1929. Nautilus 43-26,27 pl.8, figs. 2,3. " Shell large, broadly elongate-conic, bluish white in younger specimens, yellowish white in adults. Nuclear wherls small, rounded, having their axis at right angles to the succeeding turns. Post-nuclear whorls somewhatv flattened and shouldered at the summits. Surface marked by heavy, rounded, closely spaced, strongly protractive axial ribs, of which fourteen occur on each of the first eight whorls,sixteen on the 9th and 10th, 18 on the 11th, and 20 on the 12th and last whorl. These ribs extend from the summit of the whorl to the periphery, where they mergeand terminate. Intercostal spaces a little narrower than the ribs, also terminating at the periphery. On the type and other adult specimens the axial ribs extend over the base, becoming more or less feeble and uneven on the anterior portion. In immature specimens (ten whorls or less) the ribs terminate at the periphery. Entire base and spire covered with fine spiral striations, visible only under a fairly strong lense. Aperture oval,posterior angle narrowly, obliquely truncated by the flattened summit. Outer lip thin,slightly contracted; inner lip slightly oblique and somewhat reflected . The type has 12 post nuclear whorls and measures :- Length 9 mm, diam. 2 mm.

The type, No. 1016, Coll. Los Angeles Museum, and 24 additional specimens were taken by Mr. H.N. Loweunder stones at Cayucos, Calif. June, 1927.

Remarks: In general shell characters this species seems to resemble T. attrita Dall and Bartsch. It is easily differentiable from this species however, by its larger size, as well as by its more protractive and different number of ribs. A study of the type species shows some individual variation in the width of the ribs and in their number. While most of the specimens are like the type in the latter character, in some specimens the increase in number of ribs occurs one whorl earlier.

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Turbonilla (Pyrgolampros) strongi Willett,1931. Nautilus 45:67, pl.14, f.4 " Shell very slender: chocolate brown (nuclear whorls decollated). Post-nuclear whorls almost straight along the sides, only very slightly rounded toward the shouldered summit and the periphery, marked by strong,rounded, slightly protractive axial ribs, of which there are 18 on the first and second, 16 on the third to sixth, 18 on the seventh, 20 on the eighth and ninth, and 24 on the tenth (last) turn. Intercostal spaces two or three times as wide as the ribs. Periphery of the last whorl obtusely angulated, marked by the continuations of the axial ribs, which remain strong to the columellar region. The type, No. 1019 Coll. of the Los Angeles Museum, has ten post-nuclear whorls, and measures: Length, 6.8 mm.; diam. 1.6 mm.

(con.)

It was taken by the writer in 25 fathoms off the north shore of Catalina Island,1920. A smaller specimen taken at the same time is in the writer's collection. Remarks: This species is proportionally the most slender of our known west American Pyrgolampros. In dimentions it more nearly resembles some of the slender species of the subgenus Turbonilla. It is probably as close to T. halibrecta Dall and Bartsch as to any member of its subgenus. From this species it differs markedly in more slender proportions, different number of axials and their much stronger continuation on the base.

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Turbonilla (Pyrgolampros) skogsbergi Strong,1937 Nautilus 51:54,pl4,f.3 " Holotype: Stanford Univ. Paleo. Type Coll. No. 6054. Paratype: Stanford Univ. Paleo. Type Coll. No. 6055. Type locality: Monterey Bay, five miles north of Monterey, California , at a depth of 28 fathoms.

" Shell slender, acutely conic, shining, whitish, with, beginning on the third or fourth whorl, a brown band covering the anterior third of the whorls between the sutures and extending over the periphery to the middle of the base; nuclear whorls small, depressed, not immersed, having their axis at right angles to that of the following whorls; postnuclear whorls moderately rounded, sutures distinct; axial sculpture consisting of about 18 broad, nearly straight, slightly protractive ribs which extend from suture to suture but fade out just below the periphery, with shallow, narrower interspaces; spiral sculpture of numerous, fine, closely-spaced, striations over the entire surface; periphery well rounded; base rather short, well rounded; aperture subquadrate,posterior angle acute,outer lip thin, showing the brown color band within; columella slender nearly straight. The holotype has lost the nucleus and first postnuclear whorl, the remaining 8 whorls measure: length 5.6, maximum diameter , 2.0 mm. The description of the nucleus was taken from an immature paratype of 5 whorls which measures length 2.5, maximum diameter, o.8 mm. Comparison: This species is nearest to Turbonilla (Pyrgolampros) newcombei Dall and Bartsch from British Columbia , differing principally in the wider ribs and shorter base. "...

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Turbonilla (Pyrgiscus) burchi Gordon,1938. Nautilus 52:49,50, pl.4, figs. 3-5. " Shell large,broadly-conic, flesh-colored with a wide brown band which extends from one fourth the distance from the suture to the periphery, to one fourth the distance from the periphery to the columella. Early nuclear whorls broken away; remaining half turn smooth, slightly oblique, and slightly immersed in the first post-nuclear whorl. Post nuclear whorls rounded, slightly appressed at the summit, marked on the early whorls by rather strong, almost vertical, rounded, axial ribs, which become slightly retractive on the last three whorls. of these there are 14 on the third, 16 on the fourth to sixth, 17 on the seventh, 18 on the eighth,20 on the ninth, 22 on the tenth, and 28 on the last whorl. The spiral sculpture consists of heavily incised lirae or elongated pits and finely incised lines. There are five rows of the elongated pits; the first, second , and fourth of equal strength, and the third and fifth slightly stronger. The first of these marks the posterior boundary of the brown color band, the second is just anterior to it, the fifth is almost at the periphery, the fourth is the same distance posterior to it as the first to the second, and the third is half way between the second and fourth. The flesh-colored area in front of the suture is marked by five finely incised lines of equal strength and equidistant except for the third and fourth which are set s slightly farther apart. There are two finely incised lines between the first

(con.)

and second rows of spiral pits, two between the second and third, three between the third and fourth, and none between the fourth and fifth. The spiral sculpture does not cross the summits of the axial ribs though several of the rows of spiral pits encroach well upon the slopes. The periphwry is well rpunded and marked by a smooth area as wide as that separating the fourth and fifth rows of spiral pits. A few of the axial ribs cross the periphery but these evanesce quickly. The base is well rounded and marked by eighteen fairly strong, subequal, spiral grooves which are unequally spaced. Aperture moderately large, rhomboidal; posterior angle acute; outer lip thin, showing the sculpture within; columella moderately thin, oblique, revolute, but almost straight; parietal wall covered by a thin callus. The type posseses eleven whorls and measures : height, 10.4, greatest diameter, 2.9 mm.

Holotype: No. 1057 Los Angeles Museum coll. dredged at 25 fathoms in gravel one mile west of the pier at Redondo Beach, Calif. by M. Gordon and J.Q. Burch in June,1938.

A study of the paratypes shows that the finely incised spiral lines do not constitute a constant character, the specimen in the suthor's collection possessing twelve of these in the flesh-colored zone anterior to the first row of spiral pits. The rows of spiral pits, however, are a always five in number though varying in strength from the type, and are especially apparent on the earlier post-nuclear whorls.

The species is evidently most closely related to Turbonilla (Pyrgiscus) dora Bartsch but differs from that species in being banded, in having stronger and less numerous axial ribs on all the whorls, less appressment at the suture, a different pattern of spiral sculpture, and not as many spiral grooves on the base.

The species is named for Mr. John Q. Burch of Redondo Beach, Calif.

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Odostomia (Chrysallida) ornatissima (Haas),1943. Described as Chrysallida (Chrysallida) ornatissima - Zoological Series of the Field Museum of Natural History, vol. 29, no. 1, 1943, pp 4-5, pl.2, figs a,b,c. " Type from Point Pinos, Monterey Peninsula, California; washed from sand in a tide pool. No. 17029 Field Museum of Natural History. Collected May 19,1941, by Fritz Haas.

Diagnosis.- A medium sized species of the typical subgenus of the pyramidellid genus Chrysallida , characterized by a slender conic shell, an upper constriction of the whorls, and a peculiar pattern of shell sculpture.

Comparisons: The presence of only three keels on the nuclear whorl suggests a closer relation to species like C. oregonensis Dall and Bartsch, but the sculptural pattern of the post-nuclear whorls is quite different from that present in the group mentioned. It closely resembles the pattern seen in species like C. oldroydi Dall and Bartsch, but these differ in having five keels developed on their nuclear whorls. The classification of the species of Chrysallida is still rather artificial, being based on unstable characters, such as the mutual relation of spiral or axial sculptural elements , and the preponderance of one or the other, so that the relation of the new form with any of the many congeneric species can not yet be stated.

Description of type.- Shell elongate-conic, shiny white, composed of five and one half whorls which increase gradually. Nuclear whorls one and one half, with three keels, the upper of which forms a sharp edge (fig.2c); the first half of the nuclear whorls is immersed(fig.2 b). The four post-nuclear whorls are a little inflated, the two upper ones with almost straight sides, the two lower ones with rounded sides. They are separated by a deeply incised suture. The upper part of every post-nuclear whorl shows a narrow but decided and almost concave constriction. The shell is highly ornamented by a sculpture in which axial and spiral elements are almost equal; only on the base of the last whorl does the spiral element predominate. There are three spiral cords on the first and on the second post-nuclear whorls, four on the thirs and five on the fourth, while the base of the shell shows about seven. All these cords are separated by sharply incised furrows about one half as wide as the cords themselves; on the base of the shell only, these incised lines are much narrower in proportion to the cords. This system of revolving cords is crossed by axial furrows approximately as wide as the incised spiral furrows, but not as deep as these; this means that the points of crossing of spiral cords and axial furrows are at a higher level than the bottom of the incised lines. The consequence of this intersection of both spiral and axial elements is a meshwork presenting the edges of the cords cut into almost square, but obtuse angled raised knobs. The lower cords of every whorl are less heavily carved than the upper ones; thus the fourth on the third whorl and the fifth on the fourth whorl are practically intact and have only a somewhat wavy outline, while the cords on the base exhibit almost no intersecting furrows. The aperture of the shell is comparatively small, oval, and simple; its right upper margin, close to the insertion, is somewhat damaged in the type. In the interior of the aperture, the external shell sculpture is somewhat visible. The base of the aperture is decidedly effuse; its left margin is so closely appressed to the base of the shell that no trace of a secondary umbilical chinck can be seen. The columella presents a very faint, hardly visible fold.

Measurements:- Height 2.7 mm., width 1.25 mm., height of aperture 1 mm.

Notes on the paratype.- No. 17030 Field Museum of Natural History. Same locality, same date and same collector as the type. Its measurements are height 2.9 mm., width 1.3 mm, height of aperture 1.1 mm. The paratype matches the description of the type perfectly, with the exception that, being higher, it has an additional fraction of a whorl (about one fourth). Its aperture is a little damaged, somewhat more so than in the type.

Discussion.- The West Coast species of *Chrysallida*, whose number was 50 when Dalland Bartsch wrote their Monograph of West American Pyramidellid Mollusks, may be double that number now. The species are generally easily recognized, since the respective sculptural patterns offer distinctive features together with differences in the general shape of the shell. It has not yet been possible to split this mass of species into natural groups, the characters used for specific distinction being, apparently, either unstable or of only secondary value. The number of keels on the phylogenetically oldest part of the shell, the nuclear whorls, might prove to be a useful means for defining natural groups. In *Chrysallida ornatissima* the pattern of sculpture closely resembles, in a general way, that of *C. oregonensis* Dall and Bartsch , except that the raised parts in *ornatissima* are impressed in *oregonensis*, and vice versa. Three main features characterize *ornatissima* : the presence of three keels on the nuclear whorls, the slender, constricted shape of the whole shell, and the type of meshwork pattern of the sculpture. No other species of *Chrysallida* appears to possess this combination, though the separate features, or combinations of two of them, occur in numerous species.

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Pyramidellidae

Pyramidella Lamarck,1799. Type (by monotypy), Trochus dolabratus L. " Shell of many whorls,turrited, umbilicated; columella with three folds; outer lip usually reinforced within, at irregular intervals, by spiral lamellar thickenings. The sculpture consists of mere lines of growth and very fine spiral striations." (Dall & Bartsch,1909, p. 19)

Subgenus Longchaeus Morch,1875. Malak. Blatt, vol. 22,1875,p.158. Type (fide Dall and Bartsch) , Pyramidella punctata Schubert and Wagner. . " Shell elongate-conic, not umbilicated, having three columella folds, a basal fasciole and p ripheral sulcus. The entire surface is marked by fine lines of growth and microscopic spiral striations." (Dall & Bartsch).

Key to Species of the Subgenus Longchaeus (from Dall & Bartsch,1909, p.21).
Shell variegated ....adamsi
Shell not variegated
Shell rose-purple anteriorly ....bicolor
Shell brown
Adult shell more than 18 mm. long .... .mexicana
Adult shell less than 14 mm. long
Sutures very strongly channeled ....conica
Sutures moderately channelled ....mazatlanica

Pyramidella adamsi Carpenter,1864. San Pedro (Lowe) south to Salina Cruz, Mexico (Lowe). Type locality: " from a species of Chama at Mazatlan.".

In spite of the above key to species it is my personal opinion that it is impossible to separate the Pyramidella of the California fauna into more than one species. Our experience has been to take many specimens of Pyramidella from Newport Bay,Orange Co., and also from Mission Bay, San Diego Co. on eel grass, and also in abundance from Todos Santos Bay, Lower California. While it is quite possible that I have before me several species I will be sincerely obliged to anyone who will show me how to separate them.

Grant and Gale, 1931, p. 865 were disposed to place P. conica variegata in the synonymy of mexicana.

I am disposed to place at least P. mexicana (Dall and Bartsch)1909 in the synonymy. (Burch).

In response to the above suggestion it was approved by Mr. E.P. Chace and several other members of the club. However, Mr. A.M. Strong in his notes seems to list both adamsi Carpenter (Newport Bay, subfossil) and P. mexicana Dall and Bartsch (Todos Santos Bay).

Collecting data: " Plentiful in July and August 1942, have been uncommon since... in Mission Bay, near Crown Point and the Causeway. By the way, how do you tell this from P, mexicana D. & B. ?" (W.K. Emerson); Estero, 10 miles S. of Ensenada; Salina Cruz,Mex. ; San Pedro, Calif. (Lowe); San Diego (Dr. F. Baker);

Pyramidella mazatlanica (Dall and Bartsch),1909. San Diego to Cape Tepoca, West Mexico. Type locality: off Cape Tepoca in 14 fathoms.

The San Diego record for this species should certainly be confirmed . No member reports it from California, and the records of the San Diego Museum of Natural History show only southern localities.

Collecting data: Conception Bay, L.C.; Magdalena Bay; Angel de la Guardia Island, Gulf of Calif. in 20 fms.; Punta Penasco in 10 fms.; Acapulco,Mexico in 20 fms. (Lowe); Espiritu Santo Island, Gulf of Calif. . (Baker).

Genus Peristichia Dall,1889. Type (by original designation): P. toreta Dall,1889.

Dr. Harald Rehder in Proc. U.S. National Museum, vol. 93, p. 195, 1943 in his discussion of the type of this genus also states that " other known species is Ividella pedroana Dall and Bartsch,1909." Dr. Rehder discusses the genus as follows: " Originally proposed as a genus of dubious affinities, Dall later placed Peristichia in the Pyramidellidae near Oscilla. Bartsch (Proc. Biol. Soc. Wash., vol. 17, p.9, Feb.5,1904) considered it a subgenus of Turbonilla. Thiele,1929, does not mention it at all, and Wenz (Handb. Palaozool. vol.6, p. 874,1940) lists it as a subgenus of Turbonilla with a question. An examination shows that it is a pyramidellid close to Triptychus and should be accorded full generic rank. It differs from Triptychus in having only one basal entrant spiral cord, instead of two, and in lacking columellar folds."

Mr. A.M. Strong, Mr. Allyn G. Smith and others of our club agree that we should follow Dr. Rehder on this.

Peristichia pedroana (Dall and Bartsch),1909. San Pedro, Calif. to Scammons Lagoon, L.C. Type locality: San Pedro.

Dr. Dall in Bulletin 112 placed this species under Odostomia, subgenus Ividella. This has often been questioned by students of the group. Mr. A.G. Smith comments " I've always thought this was completely out of place in Odostomia. Would follow Rehder on this."

Collecting data: Dredged off Catalina Island, Avalon in 25 fms.; Punta Banda, Lower Calif. littoral (Burch); Tide pools at White's Point, San Pedro; Isthmus Cove, Catalina (Strong); White's Point, San Pedro; Mission Bay, San Diego Co. (A.G. Smith);

Genus Turbonilla Risso,1826. Dr. A. Myra Keen advises on the type of this genus as follows: " The genotype of Turbonilla is T. plicatula Risso,1826 (by sub. des. Dall and Bartsch in Arnold,1903), (not Turbo plicatulus Brocchi,1814, a Turbonilla) = T. typica Dall and Bartsch in Arnold, 1903".

" Shell with a sinistral apex, cylindro-conic, many whorled, generally slender; with a single columellar fold which varies in strength and frequently is not visible in the aperture. The sculpture both axial and spiral ranges from obsolete to strongly incised lines or raised lamellae" (Dall and Bartsch,1909, p. 28).

Subgenus Turbonilla Risso s.s. Type: Turbonilla typica Dall and B Bartsch = T. plicatula Risso,1826, not Turbo plicatulus Brocchi,1814.

" Turbonillas without spiral sculpture, having prominent vertical ribs which extend from the summits of the whorls to the umbilical region; the same is true of the intercostal spaces. Usually both ribs and intercostal spaces are less strongly defined on the base below the periphery, than on the exposed portion of the whorls above it. Columella straight or slightly twisted. All our west coast forms belonging to this subgenus are small and slender, of semitranslucent bluish-white to milk white color." (Dall and Bartsch,1909, p. 29).

Turbonilla acra Dall and Bartsch,1909. Catalina Island, Calif. to Los Coronados Islands (Baker). Type locality: Catalina Island.

Collecting data: Catalina (30 to 50 fms.(Gordon); Coronados(Baker).

Turbonilla diegensis Dall and Bartsch,1909. San Pedro to San Diego.
Type locality: San Diego.

Collecting data: Mission Bay (A.G. Smith); San Pedro : San Diego, a variety on the mud flats (T.S. Oldroyd); San Diego (Orcutt);La Jolla (Chaney); San Diego12/30 Hemphill and Baker (San Diego Museum).

Turbonilla gilli Dall and Bartsch,1907. Catalina Island to San Diego.
Type locality: San Diego. Pt. Vincent to Los Coronados (Baker).

Collecting data: Off Catalina in 30-40 fathoms (Strong); South Island, Los Coronados in 18 fathoms (Baker); 12 fathoms off Point Vincent, Los Angeles Co. (Dr. W.O. Gregg).

Turbonilla gilli delmontensis Dall and Bartsch,1907. Monterey Bay,Calif.
Collecting data: Monterey Bay in 5 to 25 fms. rare (A.G. Smith).

Subgenus *Chemnitzia* D'Orbigny,1839. Type (by monotypy), *Melania campanellae* Philippi (Advice of Dr. A.M. Keen).

" Turbonillas without spiral sculpture, having prominent axial ribs which fuse or terminate at the periphery. The intercostal spaces are deep and sunken and terminate at or a little above the periphery,extending upward to the summits of the whorls. Base smooth, devoid of all sculpture. Columella straight. All our West American species belonging to this group are small, slender forms of semitranslucent bluish-white to milk white color." (Dall and Bartsch, 1909, p. 33).

This is as good a place as any for a general discussion of the subgenera of *Turbonilla.* Mr. George Willett in Trans. San Diego Soc. Nat. Hist. vol. 8,no.30, pp. 379-406, pls. 25,36 was of the opinion that *Chemnitzia* and *Strioturbonilla* should be lumped with *Turbonilla* s.s. While it seems to me that Mr. Willett made an excellent case for this practice the fact remains that there are many other students who so far from ' lumping' these groups are disposed to elevate them to generic rank. I wish some of them would explain in simple words just how they propose to conveniently separate them though in actual practice. However, Mr. A.M. Strong, our recognized authority on this family continues to use the three subgenera. Mr. A.G. Smith comments as follows: " My thought would be to leave the subgeneric names of the Pyramidellidae stand as Dall has them in Bull. 112. In our Monterey paper we follow Willett, as we believed he had a real point in grouping some of the genera in *Turbonilla.* Certainly it is difficult to separate *Turbonilla,Chemnitzia,* and *Strioturbonilla* as you indicate. However, as you are not monographing the family, I would let the situation stand as it is. Some day not too far off, someone is going to raise all subgenera to genera. Personally I am opposed to this as being unnecessary, although those who would split up the genus *Odostomia* have something to be said for their point of view. It would save some time in writing of subgeneric names which is now essential in a genus with so many species. Dr. Keen comments " I'll admit I have difficulties with these subdivisions."

However, we will follow the old classifications in this paper leaving it to some specialist and may he start work soon to adjust these matters.

Mr. A.M. Strong comments with an interesting note on a point " There are quite a number of species which it seems like we should have which have not shown up. In hunting for them I think that we have been inclined to pay too much attention to individual differences. I usually find that when one of those missing species does show up that the differences are much greater than an examination of the figure and description would lead one to expect at first glance.

Dr. Joshua L. Baily Jr. comments " I believe Chemnitzia is not identical with Turbonilla though it might profitably be consolidated with it. I would make it a subgenus or section if Dr. Strong approves."

Dr. A. Myra Keen brings up a point of interest involving the date of publication of many of these species: " I note also that Iredale discusses the date of publication of the Mazatlan Catalogue and proves pretty conclusively that it was published as a whole in 1857. The title page says 1855-1857, and there are a series of dates running through the work at the foot of certain pages. This would imply publication in parts, and I have always naively taken these dates as the dates of publication. Iredale, however, cites a note by Carpenter that shows that these dates refer to the pulling of proof sheets which were circulated among Carpenter's colleagues. The book as a whole was not issued by the British Museum until after June 1857. I am afraid this is going to mean some nomenclatorial changes. For example, Mytilus adamsianus Dunker vs. M. multiformis (see the Minutes no. 36, p.10). If these are synonymous , then adamsianus will have slight priority. Doubtless you will find other examples as you index the Minutes."

Turbonilla aepynota Dall and Bartsch,1909. San Pedro, Calif. to San Martin Island, Mexico. Type locality : off San Martin Island in 30 fms.
Collecting data: Tide pools, Point Vincente (Strong); La Jolla (Chaney); South Island, Los Coronados 3-6 fms. (Dr. F. Baker); Catalina Island in 30-70 fms. (Hanna); San Diego (Gripp); off Avalon, Catalina Island in 35 fms. (Burch).

Turbonilla clarinda Bartsch,1912. San Diego to Rodondo Beach,75 f (Burch)
Collecting data: San Diego 12-30 fms. (Hemphill); San Diego (Gordon); off Redondo Beach in 75 fms. mud bottom (Det. by A.M. Strong) (Burch).

Turbonilla engbergi Bartsch,1920. Puget Sound
Type locality: San Juan Island, Gulf of Georgia.
Collecting data: Strait of Juan de Fuca (Eyerdam); Olga, Orcas Id. Puget Sound ; Turn Island, Puget Sound (T.S. Oldroyd); Washington(Lowe).

Turbonilla gabbiana Cooper,1870. Monterey, Calif.
Collecting data: " Apparently known only from the type collected at Monterey, which is not in the Univ. of Calif. collection and is presumed to be lost. There is a possibility that T. cayucosensis Willett , which is occasionally found in beach drift at Monterey and Pacific Grove may be gabbiana although Gabb's description calls for 23 axial ribs, while cayucosensis normally has 20-22. (Syn, Chemnitzia gracillima Gabb)."(A.G. Smith)

/ Santa Monica
Turbonilla hypolispa Dall and Bartsch,1909. San Pedro and Catalina Island south to San Martin Island, Mexico. Type locality: off San Diego.
Collecting data: off Long Beach in 12 fms. (Strong); San Diego Bay in 12 and 30 fms. (Hemphill and Baker); San Martin Island (Baker); San Pedro; Catalina Island in 35 fms. (Lowe); off Santa Monica, Calif. in 15 fms. and off Malaga Cove in 15 fms. (Burch.

Turbonilla kelseyi Dall and Bartsch,1909. Santa Barbara, Calif. to San Ignacio, Mexico. Type locality: San Diego

Collecting data: Off Long Beach in 12 fms. (Strong); San Diego (T.S. Oldroyd); Mission Bay; Reef Point, Orange Co. (A.G. Smith); San Diego Bay off National City (Chace); San Diego Bay in 12 and 30 fms. (Hemphill and Baker); End of Point Loma (Baker); Laguna Beach (Lowe); between Pt. Firmin and White's Point (Dr. W.O. Gregg).

Turbonilla muricatoides Dall and Bartsch,1907. Monterey to San Pedro Type locality: Monterey

Collecting data: Monterey Bay in 15 to 25 fms. (Calif. Acad. Sci.); White's Point, San Pedro (A.G. Smith); off Monterey in 15 fms. (Burch)

/ Redondo Beach in 50-75 f.(Burch)
Turbonilla raymondi Dall and Bartsch,1909. Santa Rosa Island to San Diego.
Type locality: Off Catalina Island. to Pt. Abreojos, L.C. (Burch) (Strong)

Collecting data: Off Catalina Island in 30-40 fms. (Strong); White's Point, San Pedro (T.S, Oldroyd); off Coronado in 50 fms. (Gordon); San Diego in 10 and 30 fms. (Hemphill and Baker); Catalina Island in 35 fms. (Lowe); off Point Vincente in 12 fms. (Dr. W.O. Gregg); off Redondo (Burch). Set in Burch Coll. fr Pt. Abreojos ex M. Gordon Det. by A.M. Strong.

Turbonilla santarosana Dall and Bartsch,1909. Monterey Bay (C.A.S.) to South Coronado Island (Baker). Type locality: off Santa Rosa Id. in 53 fms.

Collecting data: Monterey Bay in 25 fms. (C.A.S.) (A.G. Smith); Newport Bay- sand bar near entrance- bar since dredged out (W.O. Gregg); Ocean Beach (Baker); South Coronado Island in 7 -14 fms. (Baker);

Subgenus Strioturbonilla Sacco,1892. Type (fide Dall and Bartsch,1909) Strioturbonilla alpina Sacco.

" Shell as in Turbonilla and Chemnitzia but finely and closely spirally striated on the spire and base. All our West American species, with the exception of T. affinis and T. smithsoni, are of bluish white to milk-white color; the two exceptions being of a yellowish cast." (Dall and Bartsch, 1909, p. 40).

Turbonilla aresta Dall and Bartsch,1909. Santa Rosa Island to San Diego Type locality: Catalina Island.

Collecting data : off Catalina Island in 30-40 fms. (Strong); White's Point, San Pedro (Det. by Bartsch, USNM) (A.G. Smith); San Diego (T.S. Oldroyd); San Diego Bay (Hemphill and Baker); San Pedro and Catalina Island in 35 fms. (Lowe); off Redondo Beach in 25 fms. and off Catalina Island in 35 fms. (Burch).

Turbonilla asser Dall and Bartsch,1909. Monterey Bay to San Diego Type locality: off Redondo Beach, Calif.

Collecting data: Midspit, San Diego Bay (Hemphill and Baker); Newport Bay (Strong); Monterey Bay in 15-25 fms. (Smith and Gordon); San Diego (Gordon); San Pedro (Chace); off Avalon, Catalina Island in 35 fms.; off Malaga Cove in 15 fms.; off Santa Monica in 15 fms.; off Redondo Beach in 25-75 fms. (Burch).

Turbonilla attrita Dall and Bartsch,1909. San Pedro to Todos Santos Bay (Burch). Type locality: San Pedro.

Collecting data:

(con.)

Collecting data: Newport Bay (Strong); off Coronado Hotel in 35 fms.(Hemphill); San Diego Bay; Point Loma in 5-8 fms. (Baker); San Pedro and Newport Bay (Lowe); San Pedro (T.S. Oldroyd); San Diego (Oldroyd); Coronado in 25 fms. (Gordon); Todos Santos Bay in 5 -10 fms. (Burchand Gordon); off Malaga Cove in 10 fms.; from pilings off Redondo Beach (Burch).

Turbonilla bakeri Bartsch,1912. / Redondo Beach to Todos Santos Bay (Burch). San Diego Bay, Calif.

Coll. Data: Off Redondo Beach 25f, Malaga Cve.,10f., off Ensenada in 15f San Pedro 15f; Crystal Pier, San Diego in pilings (Burch) (Det. by A.M. Strong

Turbonilla barkleyensis Bartsch,1917. Barkley Sound, Vancouver Island, B.C.

Collecting data: Queen Charlotte Islands (Gordon); (Oldroyd).

Turbonilla buttoni Dall and Bartsch,1909. Santa Rosa Island, Calif. to Pt. Abreojos, L.C. Type locality: San Pedro, Calif.

Collecting data: Many shore localities (Strong); San Pedro; San Diego; Pt. Abreojos; San Hipolito Pt.; La Paz, L.C. (T.S. Oldroyd); White's Point, San Pedro- common (A.G. Smith); So. Coronado Island; San Martin Island (Baker Espiritu Santo Island (Capt. Porter); San Geronimo Island (Lowe); Pt. Abreojos (Hemphill); San Diego Bay (Hemphill); Ocean Beach (Baker); Pt. Loma (Baker); Laguna Beach (Lowe) (San Diego Museum); Pt. Firmin, San Pedro (W.O. Gregg); Pt. Firmin and San Diego (Chace); Mission Bay; Santa Monica; Malaga Cove in 10 fms.; Bird Rock, San Diego Co.; off Redondo Beach in 25 fms. (Burch).

Turbonilla canadensis Bartsch,1917. Forrester Island, Alaska.

Turbonilla carpenteri Dall and Bartsch,1909. / Redondo Beach, 10 fms.(Burch). San Pedro to Coronado Islands. Type locality: San Pedro.

Collecting data: off Coronado Islands in 50 fms. (T.S. Oldroyd); La Jolla (Bristol); La Jolla (Chaney); off Redondo Beach and Malaga Cove in 10-25 fms. (Det. by A.M. Strong) (Burch).

Turbonilla cayucosensis Willett 1929. Monterey to Cayucos. Type locality: Cayucos.

Collecting data: Pacific Grove in drift (Det. by Geo. Willett) (A.G. Smith); Cayucos (Paratypes) (San Diego Museum). Off Monterey,20f (Burch)

Turbonilla dinora Bartsch,1912. San Diego, Calif.

Collecting data: San Diego (Gripp).

Turbonilla dracona Bartsch,1912. Off Redondo Beach in 25 fms.(Burch) to San Diego
Type locality: San Diego.

Collecting data: Reef Point, Orange Co. (Det. by U.S.N.M.) (A.G. Smith); off Redondo Beach in 25 fms. gravel bottom. (Det. by A.M. Strong)

Turbonilla encella Bartsch,1912. San Pedro, Calif.

Turbonilla galianoi Dall and Bartsch,1909. San Diego, Calif. to Cape San Lucas. Type locality: Cape San Lucas. San Pedro,San Diego,San Hipolito (T.S. Oldroyd).

Turbonilla humerosa Dall and Bartsch,1909. Catalina Island to San Diego
Type locality: off Catalina Island.

Turbonilla kincaidi Bartsch,1921. Proc. Biol. Soc. Wash. 34:33,34 Dogfish Bay, Puget Sound.

Collecting data: Dredged in Puget Sound near San Juan Islands,1940 (T. Kincaid); Paratypes in San Diego Museum, Gordon Collection and also A.G. Smith coll; Olga, Wash. (Engberg) (W.O. Gregg).

/ off Redondo Beach in 25 fm. s
Turbonilla profundicola Dall and Bartsch,1909. Off Catalina Island to San Diego, Calif. in 197 fms. Type locality : off La Jolla, Calif. off Redondo Beach in 25 fms. (Burch)

Turbonilla serrae Dall and Bartsch,1907. Monterey Bay to Coronado Islands (Baker). Type locality: Monterey.

Collecting data: Monterey Bay in 5 to 40 fms. (Smith and Gordon); Coronados Islands (Baker); San Diego in 15 fms. (Baker) (San Diego Mus. .) Monterey in 10-20 fms. (Strong).Redondo Beach, 25 fms. (Burch).

Turbonilla stylina Carpenter,1865. Sitkalidak I., Kodiak Is. (Eyerdam) south to Coronado Islands. Type locality: Santa Barbara. The above is an extention of range northward several thousand miles from Monterey, Calif.

Mr. A.M. Strong comments on this as follows: " Carpenter gives the locality as Monterey and Santa Barbara. Dall and Bartsch give Monterey as the type locality but list " two specimens both immature , dredged in 50 fms. off the Coronados Islands" and the range is usually given as from Monterey to the Coronados Islands. I have seen no specimens from southern California which are the same as Monterey specimens which I have. I doubt the range."

Collecting data: Monterey (Strong); Departure Bay, B.C. and Coronado Islands (T.S. Oldroyd); Monterey Bay in 10-40 fms. (Smith and Gordon); Carmel Bay in 25 fms. (C.A.S.) (A.G. Smith); off Pt. St. Vincente (Gregg); Coronado Islands in 50 fms. (Oldroyd); San Pedro (Lowe) (San Diego Mus.);

Turbonilla torquata Gould,1853. Monterey to San Diego to Todos Santos Bay Type locality ? Santa Barbara, Calif.

Mr. A.M. Strong comments on this as follows : " Dall and Bartsch describe a species which they credit to Gould. They list several localities all from deep water. All your specimens come from 25 to 75 fathoms. It is hard to see how Gould could have had a specimen of this, presumably collected on shore at Santa Barbara."

Collecting data: Monterey Bay in 10-30 fms. (Smith and Gordon); San Diego (Hemphill) (Orcutt) (T.S. Oldroyd); Todos Santos Bay ; off Redondo in 25-75 fms.; off Avalon, Catalina Island in 35 fms. (Burch). off Santa Cruz Id. in 50 fms. (Burch).

Turbonilla vancouverensis Baird,1863. Port Etches, Alaska to Monterey (Berry). Type locality: Esquimalt Harbor, Vancouver Island " Taken from the crop of a Pin-tail duck."

Collecting data: Strait of Fuca (Eyerdam); Departure Bay, B.C. in 25 fms.; Nanose Bay, B.C. in 20 fms. (T.S. Oldroyd); Uyak, Kodiak Island, Alaska (Hanna);

Turbonilla simpsoni Dall and Bartsch,1909. Off Redondo to San Diego Type locality: San Pedro, Calif.

Collecting data: off Catalina in 30-40 fms. (Strong); off Catalina in 35 fms. and also San Pedro (Lowe); San Pedro (T.S. Oldroyd); Off Redondo Beach in 25-75 fms. (Burch) (Det. by A.M. Strong).

Subgenus *Pyrgolampros* Sacco,1892. Type (by orig. des.): *Pyrgolampros mioperplicatulus* Sacco.

" Turbonillas with low, broad, rounded vertical ribs which almost always dissapear as they pass over the periphery and base of the last whorl, and many very fine, faint,wavy spiral striations; surface covered by a thin epidermis. Columella usually somewhat flexuouse.

All our west American species are of a light- yellow to chocolate brown color. The intercostal spaces are not depressed as in *Chemnitzia*, but ~~dissapear~~ appear as simple shallow undulations between the axial ribs. The spiral striations, in perfect specimens, appear as if they were situated beneath a light-colored epidermis and were shining through it." (Dall and Bartsch, 1909, p.p. 59-60.)

Turbonilla alaskana Dall and Bartsch,1909. Kodiak, Alaska to Puget Sound (Baker). Type locality: St. Paul, Kodiak, Alaska.

Collecting data: Wide Bay, Alaska in 13 fms. (Hanna, C.A.S.); Orcas Island, Puget Sound in 10-30 fms. (Dr. Fred Baker); Shuyak Strait; Raspberry Island (Eyerdam)

Turbonilla aurantia Carpenter,1864. Departure Bay, B.C. and Puget Sound
Type locality: ? Puget Sound Victoria, B.C. (Eyerdam).

Turbonilla berryi Dall and Bartsch,1907. Monterey to Catalina Island.
Type locality: Monterey.

Mr. A.G. Smith comments on this species as follows: " We believe this and *chocolata* are conspecific. Records for *berryi* should appear under *chocolata*." However, since there seems to be a difference of opinion on this matter we will carry both names for the time being.

Collecting data: Monterey Bay in 8-29 fms. (Smith and Gordon); Carmel Bay in 20 fms. (A.G. Smith); Mont rey (Strong); dredged off Monterey, Del Monte in 20 fms. (Burch.

/ Redondo Beach 25 fms, (Burch)
Turbonilla chocolata Carpenter,1864. San Pedro to San Diego.
Type locality: San Diego.

Mr. A.G. Smith is of the opinion that both *T. berryi* D & B and also *T. painei* D & B. should be placed in the synonymy of this species.

Collecting data; San Pedro (Willett); Coronado Beach 15 fms. (Gordon); off Newport Bay in 10 fms. (Strong).

Turbonilla eyerdami Bartsch,1927. Proc. U.S.N.M. vol.70,pp 8,9, pl.2,f.12
Shuyak Strait, Afognak Island, Alaska. Collected by Eyerdam in 1924.

Turbonilla franciscana Bartsch,1917. San Francisco Bay, Calif.
S.F. Bay (Albatross- C.A.S.).

Turbonilla gloriosa Bartsch,1912. Off San Diego, Calif. in 12 fms.

Turbonilla gouldii Dall and Bartsch,1909. Santa Rosa Island to San Diego
Type locality: San Pedro

Collecting data: off Long Beach in 12 fms. (Strong); San Pedro (Lowe); San Pedro- 2 sp. (T.S. Oldroyd); off Pt. Vincente in 12 fms. (W.O. Gregg); Malaga Cove in 15 fms.; (Burch); S. Coronado Island (Dr. Baker)

Turbonilla halia Dall and Bartsch,1909. Monterey (Smith and Gordon) to Todos Santos Bay (Gordon and Burch). Type locality: San Diego.

Mr. A.M. Strong in rechecking the Burch collection made the following note " If the identifications made for me in Washington are correct you do not have P. lowei or P. chocolata. I am inclined to put all your specimens in P. halia as a variable species." We are very much surprised at this but are accepting Mr. Strong's diagnosis.

Collecting data: San Pedro in 8 fms. (Lowe); Monterey Bay in 12-25 fms. and Coronado in 25 fms. (Gordon); Todos Santos Bay 5-10 fms. (Gordon and Burch); off La Jolla in 35 fms. (W.O. Gregg); Redondo Bwach 25 fms. (Burch) Santa Monica in 15 f; Monterey in 25f; off Ensenada in 15-25 f; off the large spider crab Loxorhynchus crispatus off Santa Monica (Burch).

Turbonilla halibrecha Dalland Bartsch,1909. Monterey Bay (Smith) to Catalina Island. Type locality: Catalina Island.

Collecting data: 10 fms. off Del Monte, Monterey Bay, Det. by P. Barts ch at the U.S.N.M. (A.G. Smith); off Redondo Beach in 75 fms. (Burch).

Turbonilla halistrepta Dall a nd Bartsch,1909. Monterey to San Diego Type locality: off Newport.

Collecting data: off Del Monte in 10 fms., 2 specimens which seem to belong to this species (A.G. Smith); Coronado in 25 fms. (Gordon);

Turbonilla ilfa Bartsch,1927. Proc. U.S.N.M. vol. 70, p. 7, pl.1, fig.1. San Pedro, Calif.

Collecting data: " I collected the original on Terminal Island, but evidently only found one. Bartsch says it is the largest of the Pyrgolampros." (A.G. Smith).

Turbonilla keepi Dall and Bartsch,1909. Long Beach to San Diego, Calif. Type locality: Long Beach, Calif.

Turbonilla lowei Dall and Bartsch,1903./ ~~San Pedro~~ Monterey / to ~~San Diego.~~ Todos Santos Bay, L.C . Type locality: off San Pedro, Calif.

Collecting data: San Pedro in 10 fms. (Lowe); off Coronado Hotel in 12 fms.; Ballast Pt., San Diego in 10 fms. (Dr. F. Baker); off Malaga Cove in 10 fms. (Willett); Monterey 10-40 f (Smith); Todos Santos Bay (Burch) Monterey specimens det. by Bartsch.

Turbonilla lituyana Dall and Bartsch,1909. Lituya Bay, Alaska. Konatak Lagoon, Portage Bay, Alaska in 6 fms. (Hanna).

Turbonilla lyalli Dall and Bartsch,1907. Banks Island, B.C. Banks Island (T.S. Oldroyd).

Turbonilla macouni Dall and Bartsch,1910. Barkley Sound, Vancouver Island.

Collecting data: Departure Bay, B.C. (T.S. Oldroyd).

Turbonilla middendorffi Bartsch,1927. Proc. U.S.N.M. vol. 70, pp 8,9, pl.2 fig. 2. Type locality: Shuyak Strait, Afognak Island, Alaska.

Collecting data: W.J. Eyerdam has paratypes from Shuyak. : Wide Bay, Alaska (Hanna, V.A.S.) .

Turbonilla newcombei Dall and Bartsch,1907. Port Simpson to Victoria, B.C Type locality: Port Simpson, B.C.

Collecting data: Departure Bay, B.C. (T. Oldroyd);

Turbonilla oregonensis Dalland Bartsch,1907; Off the coast of Washington and Oregon in 30 fathoms south to Crescent City, Calif. in 19 fms.(Gordon).
Collecting data: Crescent City in 19 fms. (Gordon.)

Turbonilla painei Dalland Bartsch,1909. Redondo Beach to San Diego
Type locality: off Redondo Beach, Calif.
Collecting data: Dredged off Redondo Beach in 25 fms. (Burch); off Newport Bay in 10 fms. (Strong). off Pt. Vicente in 20 fms. (Burch.

/ Victoria, B.C.
Turbonilla pedroana Dalland Bartsch,1903. Monterey to San Diego
Type locality: San Pedro. / to Todos Santos Bay (Burch.
Collecting data: off Newport in 10 fms. (Strong); San Pedro in 10 fms. (Lowe); Monterey (Lowe); off Long Beach in 8 fms. (W.O. Gregg); Monterey Bay in 10-20 fms. (Smith and Gordon); San Diego (T.S. Oldroyd); Punta Banda, L.C.; off Santa Monica in 5 fms. (Burch).

Turbonilla pugetensis Bartsch,1917. Puget Sound.

Turbonilla pesa Dall and Bartsch,1910 Barkley Sound, Vancouver Island, B.C.

Turbonilla ridgwayi Dall and Bartsch,1909. San Diego, Calif. to San Pedro
Collecting data: San Diego (T.S. Oldroyd); Bird Rock, San Diego (Baker) Point Firmin, San Pedro (Strong).

Turbonilla rinella Dall and Bartsch,1910. Barkley Sound, Vancouver Island
Collecting data: Nanaimo, B.C. (T.S. Oldroyd);

Turbonilla shuyakensis Bartsch,1927. Proc. U.S.N.M. vol. 70, pp 7,8, pl.2 fig. 1. Shuyak Strait, Afognak Island, Alaska.
Collected by W.J. Eyerdam in 1924. ; Kanatak Lagoon, Portage Bay, Alaska (Hanna, C.A.S.).

Turbonilla skogsbergi Strong,1937. See p. 17 for description.
Nautilus 51-54, pl.4, fig.3. Type locality: Monterey Bay in 28 fms.
Range: Monterey to Redondo Beach, Calif.
Collecting data: Monterey Bay in 28 fms.;(Gordon); off Capitola in 5 fms. (W. Williams); Redondo Beach in 25 fms. (Burch); Drakes Bay in 30-35 fms. are close to this (A.G. Smith); off Monterey in 20 fms. (Burch).

Turbonilla stelleri Bartsch,1927. Proc. U.S.N.M. vol. 70, pp 6,7, pl.2, f.4
Shuyak Strait, Afognak Island, Alaska. Collected by W.J. Eyerdam in 1924.

Turbonilla strongi Willett,1931. See P. 16 for description.
Nautilus 45-67, pl.14, fig.4. Type locality: " in 25 fms. off the north shore of Catalina Island."

Turbonilla talma Dall and Bartsch,1910. Barkley Sound, Vancouver Island.

Turbonilla taylori Dalland Bartsch,1907. Port Simpson to Vancouver Island
Type locality: Departure Bay, B.C. / to Puget Sound
Collecting data: Victoria, B.C. (Eyerdam); Departure Bay and Puget Sound (T.S. Oldroyd);

Turbonilla valdezi Dall and Bartsch,1907. Barkley Sound, Vancouver Island to Monterey. Type locality: Monterey. / to Cayucos (Burch).
Collecting data: Pacific Grove, 2 specimens not quite typical (A.G. Smith); Cayucos (Burch); San Pedro, Calif. specimens not typical but close (T.S. Oldroyd); off Monterey in 20 fms. shale; littoral at Cayucos; (Burch) (Det. by A.M. Strong).

Turbonilla victoriana Dall and Bartsch,1907. Vancouver Island, B.C. to Puget S.
Collecting data: Departure Bay (T.S. Oldroyd); Olga Island, Puget Snd. (Baker);

Turbonilla tremperi Bartsch,1917. Off San Diego Bay in 15 fms.
Collecting data: San Diego (Baker).

Subgenus Pyrgiscus Philippi,1841 Type (by sub. desig. Dall and Bartsch 1904), Melania rufa Philippi.
" Turbonillas having prominent axial ribs and deeply incised spiral lines, but no varices or internal lirations on the outer lip. Columella somewhat flexuous." (Dall and Bartsch,1909, p. 74).

Turbonilla adusta Dall and Bartsch,1909. San Diego, Calif. to Redondo(Burch).
Collecting records: San Diego Bay in 1½ fms. (Baker); off Redondo 25 fms. (Burch).

Turbonilla almo Dall and Bartsch,1909. Monterey (Smith & Gordon) to Todos Santos Bay (Burch and Gordon). Type locality: San Diego.
Collecting data: Mont rey Bay in 5-40 fms. (S,ith & Gordon); off Redondo Beach in 25 fms. (Burch & Gordon); Todos Santos Bay (Burch & Gordon); San Diego (T.S. Oldroyd); Arbolitos, L.C. littoral (Burch).

Turbonilla antemunda Dall and Bartsch,1909. Monterey Bay (Smith & Gordon) to San Diego (Gordon). Type locality: off Santa Rosa Island, Calif.
Collecting data: Monterey Bay in 5-15 fms.;(Smith & Gordon); off Coronado in 25 fms. (Gordon); Point Vicente (Burch).

Turbonilla antestriata Dall and Bartsch,1907. Esteros Bay to San Diego, Calif. Type locality: Esteros Bay, Calif.
Collecting data: Monterey Bay in 40 fms. (Burch); off Redondo Beach in 25 fms. (Burch); San Diego (Gripp); So. Coronado Island (Dr. Fred Baker); Ballast Point in 8 fms. (Baker); San Pedro (Lowe); off Long Beach in 12 fms. (Strong); off Catalina Island in 35 fms. (Burch); Malaga Cve. in 10 fms. (Burch).

Turbonilla aragoni Dall and Bartsch,1909. Monterey to Redondo Beach (Burch). Type locality: Monterey Bay in 20 fms.
Collecting data: Monterey Bay in 10 fms. (Det. by U.S.N.M. - Smith) (Burch); off Redondo Beach in 25 fms. (Burch); off Monterey , 10,25 & 40 fms. (Burch).

/ off Santa Monica in 15 fms.(Burch)
Turbonilla auricoma Dall and Bartsch,1903. San Pedro to Scammon's Lagoon, L.C. Type locality: Scammon's Lagoon.
Collecting data: Scammon's Lagoon; San Diego (Dr. Baker); San Pedro (Lowe); off Santa Monica in 15 fms.; San Onofre, Calif. littoral(Burch). (Det. by A.M. Strong).

Turbonilla burchi Gordon,1938. See p. 17 for description.
Nautilus 52: 49,50, pl.4, figs. 3-5.
Type locality: off Redondo Beach in 25 fms. Also dredged off Rocky Pt. in 40 fms. (Burch).

Turbonilla callia Dall and Bartsch,1909. San Diego, Calif.

Turbonilla callimene Bartsch,1912. San Diego, Calif.

Turbonilla canfieldi Dall and Bartsch,1907. Monterey Bay to Todos Santos Bay (Burch). Type locality: Monterey.

Mr. A.M. Strong comments on this species as follows: " Your specimens from off Redondo seem to be identical with that described and figured from Monterey. If so this is the only species of Turbonilla which is found in both southern California and Monterey that I know of."

Collecting data: Monterey Bay in 10-40 fms. (Smith & Gordon); Redondo Beach in 25 fms. (Burch); Todos Santos Bay in 5-10 fms. (Burch); S. Coronado Island (Baker).

Turbonilla castanea Keep,1888. Monterey Bay (Smith) to San Hipolito, L.C. (T.S. Oldroyd). Dr. A.M. Keen advises regarding the type locality " The type locality was not given in the original. Syntype labels give it as San Diego."

Collecting data: Monterey Bay, 1 specimen (A.G. Smith); San Hipolito, L.C. (T.S. Oldroyd); San Diego Bay (Dr. Baker); San Diego (Hemphill); off Newport in 10 fms. (Strong). / S. Corondo Island (Baker)

Turbonilla castanella Dall,1908. Monterey to Redondo Beach (Burch).
Type locality: Monterey.

Collecting data: Dr. A. Myra Keen advises " Oldroyd, vol. II, pl.2, p. 142 cites Pl.66, fig.7 for castanea; this is castanella."
Monterey Bay in 10-40 fms. (Smith & Gordon); Redondo Beach in 25 fms. (Burch); South Coronado Island in 14 fms. (Dr. Fred Baker); Monterey (Strong)(Burch).

Turbonilla delmontana Bartsch,1937; Nautilus 50:100,101. New name for T. delmontensis Bartsch,1927 (Proc. U.S.N.M. vol. 70, pp. 9,10, pl.2, fig. 11). Type locality: off Del Monte in 10 fms.

Turbonilla dora Bartsch,1917. San Diego, Calif.

Turbonilla eva Bartsch,1917. San Diego, Calif.

Turbonilla eucosmobasis Dall and Bartsch,1907. San Luis Obispo to San Diego, Calif. Type locality: off Santa Barbara, Calif.

Collecting records: San Pedro (Lowe).

Turbonilla grippi Bartsch,1912. San Diego.

Collecting data: San Diego (T.S. Oldroyd).

Turbonilla ina Bartsch,1917. Long Beach (Strong) to San Diego
Type locality: San Diego

Collecting data: off Long Beach in 12 fms. (Strong).

Turbonilla ista Bartsch,1917. Pt. Vincent (Strong) to San Diego
Type locality: San Diego. off Point Vincent in 12 fms. (Strong).

Turbonilla virgo Carpenter, 1864. Santa Barbara, Calif.

/ off Redondo Beach in 75 fms. (Burch)
Turbonilla weldi Dall and Bartsch, 1909. Off Point Firmin, Calif.

Mr. George Willett in his Baldwin Hills paper in Trans. San Diego Soc. was of the opinion that the species arata (from off Catalina Island) and listed under the subgenus Bartschella is conspecific with this species. Mr. Allyn G. Smith comments on this" I think G.W. had a good point. You might follow him on it by combining it and T. (Bartschella) arata, but consider he was dealing with fossils and the Recent material might not bear out his opinion." No member of the club has reported the species.

Turbonilla wickhami Dall and Bartsch, 1909. Catalina Island, Calif.

Subgenus Mormula A. Adams, 1864. Type (Sub. Desig. Verrill-Bush, 1900), Mormula rissoina Adams.

" Turbonillas having axial ribs and deeply incised spiral lines; also irregularly disposed varices on the outer surface, which usually mark internal lirations on the outer lip, or internal lirations of the outer lip only" Sculpture never nodulose." (Dall and Bartsch, 1909, p. 110.).

Turbonilla ambusta Dall and Bartsch, 1909. Redondo Beach to San Diego.

Mr. Allyn G. Smith comments " Gordonand I believe this and tridentata are conspecific." There is disagreement on this though so we list it.

Collecting data: Ocean Beach and off South Corinado Island in 16 fms. (Dr. F. Baker); off Malaga Cove in 15 fms. and also from Newport Bay (Burch) (Det. by A.M. Strong).

Turbonilla catalinensis Dall and Bartsch, 1909. Catalina Island, Redondo Beach (Burch) to San Diego (Baker). Type locality: Catalina Island.

Mr. A.M. Strong comments on the Burch specimens as follows: " This species is supposed to have external varices. Your specimens only occasionally show indications of varices but seem to agree in other ways. Most of them are young."

Collecting data: off Redondo Beach in 75 fms. (Burch); off Catalina Island in 30-40 fms. (Strong); Santa Barbara Chennel in 85 fms.(Crocker); (Gordon Coll.); Catalina Island in 35 fms. and San Pedro (Lowe); Ocean Beach (Baker);

Turbonilla clementina Bartsch, 1927. Proc. U.S.N.M. vol. 70: 11, pl.2, f.9,10. Type locality: San Clemente Island.

No collecting records and only comment is from Allyn G. Smith " Bartsch says related to T. dora Bartsch, which is a Pyrgolampros ?"

Turbonilla enna Bartsch, 1927. Proc. U.S.N.M. vol. 70: 10,11 pl.2, fig.8. Type locality: off Deadman's Island, San Pedro, Calif. in 6 fms.

/sch
Turbonilla escholtzi Dall and Bartsch, 1907. (eschscholtzi) Izhut Bay, Afognak Island, 1922 and Drier Bay, Knight Island, 1923 (Eyerdam) south to Vancouver Island, B.C. Type locality: Carter Bay, B.C. to San Diego?

Collecting data: Eyerdam's record listed above is an extension of range northward rom Port Simpson; there is a record with a ? in the San Diego Museum from Ballast Pt., San Diego in 8-10 fms, by Dr. F. Baker; Departure Bay B.C. (T. Oldroyd); Ocean Beach (Baker);

Turbonilla heterolopha Dall and Bartsch,1909. San Diego, Calif. to San Hipolito Point, L.C. Type locality: San Diego, Calif.
Collecting data: San Diego (Kelsey);

Turbonilla lordi E.A. Smith,1880. Sitka, Alaska to Puget Sound. Type locality: Vancouver Island, B.C.
Collecting data: Craig Island, Alaska in 20-40 fms. (G. Willett); off San Juan Islands, Puget Sound (T. Kincaid); Alaska (Lowe);

Turbonilla pentalopha Dall and Bartsch,1903. Off Santa Monica, Calif. (Burch) to Todos Santos Bay, L.C. Type locality: San Diego.
Collecting data: Off Santa Monica in 15 fms.; off Redondo Beach in 25 fms. (Burch); off South Coronado Island in 10 fms. (Baker); San Pedro (T.S. Oldroyd); Isthmus Cove, Catalina Island (Strong);

Turbonilla periscelida Dall and Bartsch,1909. Santa Rosa Island, Calif.

Turbonilla regina Dalland Bartsch,1909. Santa Rosa Island to Catalina Island. Type locality: Santa Rosa Island. Off Redondo Beach in 75-100 fms. (Burch) (Det. by A.M. Strong).

Turbonilla santarosana Dall and Bartsch,1909. / Redondo Beach, 75 fms. (Burch) Santa Rosa Island to Todos Santos Bay, L.C. Type locality: off Santa Rosa Island, Calif. in 53 fms. (T.S. Oldroyd)

Turbonilla tridentata Carpenter,1864. Monterey to San Diego,to La Paz,L.C. Type locality: Monterey, Calif. (by holotype label in U.S.N.M. (Keen)
Collecting data: Dredged off Santa Monica in 15 fms.; off Malaga Cove and Redondo Beach in 15-25 fms.; off Catalina Island in 35 fms.; Mission Bay in eel grass; off Monterey in 20 fms. on shale bottom (Burch); Newport Bay (Strong);) Chace) (Gregg); Monterey in 10-40 fms.; Carmel Bay in 20 f (A.G. Smith); San Pedro littoral; La Paz, L.C.; (T.S. Oldroyd); San Diego (Hemphill); Ocean Beach (Bristol); Newport Bay (Baker) (Lowe); Mission Bay and San Pedro (Lowe);

Subgenus Bartschella Iredale,1916. Proc. Malac. Soc. London, vol. 12, pt. 1, p. 36. Type (by orig. desig.); Dunkeria subangulata Carpenter.

Dr. A. Myra Keen advises on this as follows: " For Bartschella you may use the description Dall and Bartsch give for Dunkeria (1909, p. 120). As Iredale points out, their reinterpretation of type species is inadmissible under the rules, so Iredale proposed the genus Bartschells for Dunkeria subangulata. The name Dunkeria then applies to the group Dalland Bartsch called Pyrgisculus, and the latter goes into synonymy. This change was made in Bull. 112, though without comment. Although the genotype of Dunkeria by designation of Dall and Bartsch,1904 (D. paucilirata Carpenter) is not identical with the genotype of Pyrgisculus, it is congeneric, so that you may use Dall and Bartsch's description of the latter for Dunkeria."

" Turbonillas having the whorls stronger, rounded, and usually shouldered , marked by strong axial ribs and strong spiral cords, the junctions of which are frequently subnodulous." (Dall & Bartsch,1909, p.120- for Dunkeria)

Turbonilla laminata Carpenter,1864. / 3 mi. N. of Cayucos (A.G. Smith) Redondo Beach (Burch) to South Coronado Islands (Baker), San Diego. Type locality: Santa Barbara & San Diego
Collecting data: off Redondo Beach in 25 fms.; (Burch); S. Coronado Id. in 10 fms. (Baker); San Diego(Hemphill) (San Diego Bay (Baker); Ballast Pt.(Kelsey); Ocaean Beach; San Martin Id., L.C. (Baker); San Pedro (Lowe); Whites Pt.; Reef Pt.; Mission Bay (A.G. Smith); Pt. Firmin,San Pedro(Strong); San Pedro (Chace); Portuguese Bend (Gregg).

#6[illegible] p 65 July, 1946 / to La Jolla

Turbonilla arata Dall and Bartsch, 1909. Off Catalina Island, Calif.
As stated above Mr. George Willett was of the opinion that this species is conspecific with T. weldi placed under Pyrgiscus.
Collecting data: La Jolla (Bristol) (San Diego Museum);

Subgenus Dunkeria Carpenter, 1857. Type (by Sub. Desig. Dall & Bartsch, 1904), Dunkeria paucilirata Carpenter.
" Turbonillas with a turrited spire having the whorls decidedly contracted at the suture, and tabulated at the summit, marked on the spire and base by many well incised lines." (Dall & Bartsch, 1909, p.126- Pyrgisculus)

Turbonilla swani Dall and Bartsch, 1909. San Pedro, Calif.

Genus Odostomia Fleming, 1813. Dr. A. Myra Keen advised on this genus as follows: " The genus Odostomia dates from Fleming, 1813. Edinburgh Encyclopedia, vol. 7, p. 67. Type (fide Winckworth, 1932), Turbo plicatus Montagu."
" Shell with sinistral apex, usually short, few whorled, subconic or ovate, with a single columellar fold which varies in strength and sometimes is not apparent at the aperture. The sculpture varies from smooth to lamellar axial ribs and spiral keels." (Dall & Bartsch, 1909, p. 131).

Subgenus Salasiella Dall and Bartsch, 1909. Type (by Orig. Desig.), Odostomia laxa Dall and Bartsch.
" Shell pupiform, whorls inflated, marked by axial ribs which extend undiminished from the summit to the umbilical area. Varices strong, irregularly distributed." (Dall and Bartsch, 1909, p. 133).

Odostomia laxa Dall and Bartsch, 1909. Catalina Island (Gordon) to Scammons Lagoon, L.C. Type locality: Scammons Lagoon. Espiritu Santo Id.(Baker)
Collecting data: Off Catalina in 30-70 fms. (Gordon); Coronado Id.(Baker

Odostomia richi Dall and Bartsch, 1909. San Pedro, Calif.

Subgenus Salassia De Folin, 1885. Type (Sub. Desig. Dall & Bartsch), S. carinata De Folin = Salassia tropidata Dall and Bartsch

Odostomia oenoa Bartsch, 1927. Proc. U.S.N.M. vol. 70, p. 12, pl. 2, fig. 3 . Type locality: off Deadman's Island, San Pedro in 6 fms.
Collecting data: Isthmus Cove, Catalina Island (Strong).
Range: Catalina Island and San Pedro.

Subgenus Besla Dall and Bartsch, 1904. Type (by Orig. Desig.), Chrysallida convexa Carpenter.
" Small Odostomias with axial ribs and three strong spiral raised threads, one at and two posterior to the periphery between the sutures; base marked by raised spiral threads." (Dall & Bartsch, 1909, p. 135).

Odostomia callimorpha Dall and Bartsch, 1909. San Pedro, Calif. to Todos Santos Bay (Orcutt). Type locality: San Pedro.

Subgenus Chrysallida Carpenter, 1856. Type (Sub. Desig. Dall & Bartsch, 1909), Chrysallida communis Carpenter, not Chemnitzia communis C.B. Adams, 1852 - Odostomia (Chrysallis) torrita Dall & Bartsch, 1909.

" Odostomias having strong axial ribs crossed by equally strong spiral keels between the sutures, the intersection of these two elements forming nodules. The axial ribs pass only faintly over the base, while the spiral sculpture remains quite prominent." (Dall and Bartsch, 1909, p. 137).

As stated above there has been a disposition to raise the subgenera of both Odostomia and Turbonilla to generic standing. Of course, they may be right if many of these subgenera do not overlap. As a matter of fact it seems to me that there is little enough difference between some species of Odostomia and Turbonilla. Perhaps some species could actually be placed in ither with a fair argument to support it. The above remarks were made because several species of this group recently described were described by using Chrysallida with generic standing. Mr. Allyn G. Smith comments on this " If the taxonomic reason for splitting is merely to elevate a lot of new genera thus making room for more new subgenera, then there is no end to the possibilities. You gain nothing real."

Odostomia astricta Dall and Bartsch, 1907. Moss Beach , San Mateo Co., Calif. (Vokes) to San Diego (Gripp). to Lower Calif. (T.S. Oldroyd).
Type locality: Monterey, Calif.
Collecting data: Monterey Bay in 5-30 fms. (Smith and Gordon);
Odostomia catalinensis Bartsch, 1927. Proc. U.S.N.M. vol. 70, p. 17, pl. 3, fig. 4. Type locality: " on abalone at Catalina Island".
Collecting data: Catalina Island (Lowe and Baker); Isthmus Cove, Catalina Island (Paratypes) (Strong);
Odostomia chacei Bartsch, 1927. Proc. U.S.N.M. vol. 70, pp. 16, 17, pl. 3, fig. 3. Cayucos, Calif. 3 mi. N. of Cayucos (A.G. Smith).
Odostomia cincta Carpenter, 1864. Santa Barbara to San Diego
Type locality: Santa Barbara Islands.
Collecting data: San Diego (Hemphill); La Jolla (Chaney); San Pedro and San Diego (T.S. Oldroyd); Isthmus Cove, Catalina Island (Strong).
Odostomia clementensis Bartsch, 1927. Proc. U.S.N.M. vol. 70, pp. 15, 16, pl. 3, fig. 2. Type locality: San Clemente Island.
Range: Monterey Bay in 5-15 fms. south to San Clemente Island.
The Monterey record is a northern extension of range by A.G. Smith.
Odostomia clementina Dall and Bartsch, 1909. Santa Cruz and Catalina Islands south to South Coronado Island. Type locality: San Clemente Island.
Collecting data: So. Coronado Island (Dr. Baker); Isthmus Cove, Catalina Island and Santa Cruz Island (A.M. Strong); Avalon, Catalina, littoral (A.G. Smith) (Det. by Bartsch at U.S.N.M.).
Odostomia cooperi Dall and Bartsch, 1907. Monterey, Calif.
Collecting data: Monterey Bay, shore to 25 fms. (Smith and Gordon);
Mr. A.G. Smith suggests that this species is very close to O. montereyensis and may be conspecific.
Odostomia cumshewaensis Bartsch, 1927. Proc. U.S.N.M. vol. 70, pp. 13, 14, pl. 3, fig. 10. Type locality: Cumshewa Inlet, British Columbia.
Odostomia dicella Bartsch, 1912. San Diego
Coll. Data: La Jolla (Chaney);

Odostomia eugena Dall & Bartsch, 1909. Redondo Beach (Burch) to San Hipolito Point, L.C. Type locality: San Hipolito Pt.
Coll. Data: Off Redondo Beach 25-75 fms.; off Avalon, Catalina in 25 fms.

(con.)

(Burch); San Pedro in 10 fms. (Lowe); So. Coronado Island (Dr. Baker); Laguna Beach (Strong); San Pedro (T.S. Oldroyd); Reef Pt., Orange Co. (A.G. Smith);

Odostomia euglypta E. Jordan,1920. Crescent City (Chace) to Trinidad
Type locality: Trinidad.

Odostomia fia Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 12,13, pl. 3, fig.8
Type locality: Todos Santos Bay, L.C.

Odostomia helga Dall and Bartsch,1909. Redondo Beach (Burch) south to San Geronimo Island, Gulf of Calif. (Lowe). Type locality: San Diego,Calif

Collecting data: Redondo Beach, shore to 25 fms.; Pt. Vicente,littoral; Corona del Mar; Ensenada,L.C.; Mission Bay; Dana Point; Punta Banda,L.C.; on Haliotis along Palos Verdes (Burch); off S. Coronado Id. in 7-14 fms.; Pacific Beach (Dr. Baker); National City(Emery); San Diego (Hemphill) (Stephens); Bird Rock (Baker); San Pedro; San Clemente Island (Lowe); San Pedro (Chace); Reef Pt ., Orange Co.; Avalon, Catalina; La Jolla (A.G Smith); San Pedroand San Diego (T.S. Oldroyd).

Odostomia heterocincta Bartsch,1912. San Diego, Calif.

Odostomia lucca Dall and Bartsch,1909. Monterey to San Diego
Type locality: San Diego, Calif.

Collecting data: Monterey Bay in 15 fms. (Gordon).

Odostomia montereyensis Dalland Bartsch,1907. Monterey to San Luis Obispo
Type locality: off Del Monte, Monterey Bay, Calif.

Collecting data: Monterey (Strong); Monterey Bay, shore to 30 fms. (A.G. Smith).; off Monterey in 15 fms. (Burch.

Odostomia oldroydi Dall and Bartsch,1909. Monterey to Coronado Islands.
Type locality: San Diego.

Collecting data: Monterey Bay, beach drift and 10 fms. (Smith & Gordon); San Pedro (T.S. Oldroyd); So. Coronado Island (Baker); San Pedro and Reef Pt. in 12 fms. (Lowe); San Pedro, Pt. Firmin; Portuguese Bend; off Pt. Vicente in 12 fms. (W.O. Gregg); White's Pt.; Reef Pt. in 10 fms.(Strong).

Odostomia oregonensis Dalland Bartsch,1907. Queen Charlotte Islands, B.C. south to Cayucos, San Luis Obispo Co. (A.G. Smith). Type locality: Cumshewa Inlet, Queen Charlotte Islands, B.C. in 10 fms.

Collecting data: Cayucos; Monterey, shore to 15 fms. (A.G. Smith);

Odostomia ornatissima (Haas), 1943. See description, pp 18-19 this issue.
Zoological Series of Field Museum of Natural History, vol. 29, no. 1,1943, pp. 4-5, pl.2, a,b,c. Point Pinos, Monterey Peninsula.

Odostomia promices Dall and Bartsch,1909. San Diego ? Todos Santos Bay, L .C.
Type locality: Todos Santos Bay.

Odostomia pulcherrima Dalland Bartsch,1909. San Pedro, to San Diego.
Type locality: San Pedro.

Collecting data: San Diego (Kelsey) ; La Jolla (Chaney); White's Pt. San Pedro (A.G. Smith); San Pedro (Mrs. Baldridge) (A.G. Smith).

Odostomia pulcia Dall and Bartsch,1909. San Pedro to San Martin Island, L .C.
Type locality: San Pedro.

Collecting data: San Martin Island (Dr. Baker); S. Coronado Island (Baker); San Pedro(Lowe) (Gordon) Mrs. Baldridge); White's Point, San Pedro on Homalopoma bacula Carp. (Strong); White's Pt. (A.G. Smith); San Pedro (Chace); Portuguese Bend (W.O. Gregg).

Odostomia ritteri Dall and Bartsch,1909. Catalina Island to San Diego, Calif.
Type locality: off Catalina Island. Redondo Beach in 25 fms. (Burch)

Collecting data: Off Catalina in 30-40 fms. (Strong).

Odostomia sanctorum Dall & Bartsch,1909. Todos Santos Bay: T ype locality.
~~Range: La Jolla (Chaney)~~s. to San Hipolito Pt. and Magdalena Bay(Orcutt).

Odostomia sapia Dall and Bartsch,1909. San Diego, Calif.
Odostomia thalia Bartsch,1912. Coronado Islands.
Odostomia trachis Dall and Bartsch,1909. Monterey to San Martin Id. , L.C
Type locality: San Pedro, Calif.

Collecting data: off Redondo Beach; Punta Banda, L.C.; Arbolitos,L.C.; San Pedro breakwater; (Burch); off S. Coronado Island (Baker); off Point Firmin in 12 fms.and Santa Cruz Island (Strong); San Martin Island (Baker); Catalina Island in 35 fms. (Lowe); Mr. A.G. Smith reports that neither he nor Mac Gordon have taken this species at Monterey. The record is in question.

Odostomia tremperi Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 14,15, pl. 3, fig. 1. San Clemente Island.
Odostomia vicola Dall and Bartsch,1909. Monterey (Smith & Gordon) to San Pedro. Type locality: San Pedro.
Odostomia vincta Dall and Bartsch,1909. San Pedro, Calif.

Collecting data: San Pedro (Gordon).

Odostomia virginalis Dall and Bartsch,1909. Redondo Beach (Burch) to Point Abreojos, L.C. Type locality: Todos Santos Bay, L.C.

Collecting data: Off Redondo Beach 5 to 25 fms.; Corona del Mar,; Pt. Vicente (Burch); N. Coronado Island (Frank Stephens); San Pedro (Lowe); (T.S. Oldroyd); White's Point; Reef Pt., Orange Co. (A.G. Smith); San Diego (Gordon); White's Point, San Pedro (Strong); Pt. Vicente (Gregg);

Subgenus Ividella Dall and Bartsch,1909. Type (by Orig. Desig.), Odostomia navisa Dall and Bartsch,1907.

" Odostomias marked with lamellar spiral ridges and equally strong lamellar axial ribs, both of which ornament spire and base." (Dall and Bartsch,1909, p. 172).

Odostomia navisa Dall and Bartsch,1909. San Pedro, Calif. to Scammon's Lagoon. Type locality: Scammon's Lagoon.

Collecting data: White's Point, San Pedro; Guadalupe Island (Strong); South Coronado Island in 7-10 fms. (Dr. Baker); La Jolla (Chaney); San Pedro (Lowe);(T.S. Oldroyd)l; Catalina Island in 30-70 fms. (Hanna- C.A.S.) San Diego (T.S. Oldroyd); Scammon's Lagoon (Hemphill);

Odostomia navisa delmontensis Dall and Bartsch,1907. Off Del Monte, Monterey Bay, Calif. to ? San Diego Type locality: off Del Monte

Collecting data: Monterey Bay in 10-30 fms.; San Diego (T.S. Oldroyd- " Would be inclined to question this lot with a Gordon label- subject to confirmation." However, there are several sets in the San Diego Museum so labelled, collected by Hemphill and T.S. Oldroyd.

Subgenus Miralda A. Adams, 1864. Type (by Sub. Desig. Verrill & Bush, 1900), Parthenia diadema A. Adams.

" Odostomias with very strong spiral keels between the sutures and on the base; the anterior one of which, and sometimes the next one to it, strongly crenulate; the remainder simple and acute. Base axially striate." (Dall & Bartsch,1909, p. 176).

Odostomia hemphilli Dall and Bartsch,1909. San Pedro to Point Abreojos,L.C
Type locality: San Hipolito Pt., L.C.

Collecting data: Lower California localities (Strong).

Odostomia aepynota Dall and Bartsch,1909. San Pedro to Cape San Lucas.
Type locality: San Pedro. Co

Collecting data: White's Pt., San Pedro; Guadalupe Island (Strong) (con.)

White's Pt. (T.S. Oldroyd); San Pedro (Lowe); No. Coronado Island (F. Stephens); So. Coronado Island (Baker); Conception Bay, L.C. (Bancroft); San Martin Island, L.C. (Baker); San Diego; White's Pt. (Gordon); Reef Pt., Orange Co. (A.G. Smith); Pt. Vicente in 12 fms. (W.O. Gregg)

Subgenus Ivara Dall and Bartsch,1903. Type (by monotypy), Odostomia terricula Dall.

" Odostomias having feebly developed axial ribs which are usually only indicated near the summits of the whorls; spiral sculpture consisting of many subequally spaced fine lirations; summits of the whorls strongly tabulated." (Dall and Bartsch,1909, p 179).

Odostomia terricula Dall and Bartsch,1903. Monterey to Point Abreojos,L.C. Type locality: San Pedro, Calif.

This specific name has been generally spelled turricula. Dr. A.M. Keen advises on this : " Although Dalland Bartsch afterward said terricula was a misprint, it was used consistently in text and plate explanations, and as no derivation was given for the name, there is no internal evidence that justifies change to turricula."

Collecting data: Portuguese Bend, L.A. Co. (W.O. Gregg); Monterey Bay in 25 fms. (Smith and Gordon); San Pedro (Gordon); Reef Pt., Orange Co., (A.G. Smith); Todos Santos Bay (Orcutt); Scammon's Lagoon (Baker); San Martin Island; So. Coronado Island in 3 fms.; Bird Rock, San Diego Co.;(Baker); Del Mar (Kate Stephens); La Jolla (Kelsey); San Pedro (Lowe);

Subgenus Evalina Dall and Bartsch,1904. Type (by Orig. Desig.), Odostomia americana Dalland Bartsch.

" Odostomias having feebly developed axial ribs which are usually only indicated near the summit of the whorls; spiral sculpture consisting of many fine lirations; summit of the whorls not tabulated." (Dall & Bartsch,1909, p. 180).

Odostomia amwricana Dalland Bartsch,1904. San Pedro, Calif. to San Martin Island (Baker). Type locality: San Pedro, Calif.

Collecting data: White's Point, San Pedro (Strong); (Chace); (Gordon); San Martin Island, L.C.; So. Coronado Island in 7-10 fms. (Baker); North Coronado Island (F. Stephens); San Pedro (Lowe);

Subgenus Iolaea A. Adams, 1867. Type (fide Dall & Bartsch), Iole scitula A. Adams.

" Shell umbilicated, marked by spiral cords, and axial riblets which cross the grooves between them." (Dall & Bartsch,1909, p. 181.)

Odostomia amianta Dall and Bartsch,1907. Moss Beach, San Mateo Co. to Po nt Abreojos, L.C. Type l cality: Point Abreojos, L.C.

Collecting data: Off Monterey in 40 fms.; off Catalina Island in 25 fms.; off Redondo Beach in 5-75 fms.; off Santa Cruz Island in 50 fms. (Burch); off Reef Pt. in 10 fms. (Strong); off Pt. Vicente in 12 fms. (W.O. Gregg); Monterey Bay, shore to 30 fms. (Smith and Gordon); San Pedro (Gordon); San Diego (Hemphill); San Pedro (Lowe);

Odostomia eucosmia Dall and Bartsch,1909. San Pedro, Calif. to Point Abreojos Type locality: Point Abreojos, L.C.

Collecting data: White's Pt., San Pedro(Strong); (A.G. Smith); (Gordon); (Lowe); Reef Pt. Orange Co. (A.G. Smith); bet. Pt. Firmin & White's Pt.

(con.)

(W.O. Gregg); So. Coronado Island; San Martin Island,L.C.; Bird Rock,San Diego Co.; La Jolla (Baker); San Diego (Hemphill);

Subgenus *Menestho* Moller,1842. Type (by monotypy), *Turbo albulus* Fabricius.

" Shell not umbilicated, marked by moderately well developed and usually equally spaced spiral cords; axial sculpture reduced to mere lines of growth which frequently appear as very slender raised threads in the grooves between the cords." (Dalland Bartsch 1909, p. 184.).

See page 47- for additional species.

Odostomia amilda Dall and Bartsch,1909. San Diego to San Martin Island,L.C (Strong). Type locality: San Diego, Calif.

Collecting data: San Diego (Gordon); San Martin Island (Strong);

Odostomia enora Dalland Bartsch,1909. San Pedro, Calif.

Odostomia exara Dall and Bartsch,1907. Monterey, Calif. to San Diego(?) Type locality: Monterey.

Collecting data: Monterey Bay in 5-15 fms. (A.G. Smith); one lot in the Gordon collection from San Diego labelled *cf. exara.*

Odostomia excisa Bartsch,1912. Catalina Island, Calif.

Odostomia farma Dalland Bartsch,1909. Catalina Island to La Jolla (Chaney). Type locality: Catalina Island.

Odostomia fetella Dalland Bartsch,1909. Malaga Cove, Santa Monica Bay (Burch) to San Ignacio Lagoon, L.C. Type locality: San Diego.

Collecting data: Malaga Cove, littoral; Mission Bay from eel grass; Todos Santos Bay (Burch); Newport Bay on oysters (Strong); (A.G. Smith); Anaheim Bay (Chace) (A.G. Smith) (W.O. Gregg- on *Ostrea lurida*); Reef Pt., Orange Co. (A.G. Smith); San Diego (Gordon); San Pedro; Anaheim; (Lowe); Bird Rock; San Diego (Baker); San Pedro (Chace);

Odostomia gloriosa Bartsch,1912. San Diego, Calif. to San Hipolito Pt.,L.C Type locality: San Diego.

Collecting data: San Diego (Gordon);

Odostomia harfordensis Dall and Bartsch,1907. Port Harford, Calif.

Odostomia hypocurta Dall and Bartsch,1909. Bristol Bay,Bering Sea in 33 fms.

Odostomia pharcida Dall and Bartsch,1907. Queen Charlotte Islands, B.C.

Subgenus *Evalea* A. Adams, 1860. Type (by Sub. Desig. Verrill and Bush), 1900), *Evalea elegans* A. Adams.

" Odostomias having the surface marked by fine incised spiral lines." (Dalland Bartsch,1909, p. 192).

Odostomia aleutica Dall and Bartsch,1909. Captain's Bay, Unalaska Island,Al.

Odostomia altina Dalland Bartsch,1909. Off San Diego, Calif. in 359 fms.

Odostomia amchitka Dall and Bartsch,1909. Amchitka Island, Aleutians to Forrester Island, Alaska (Willett). Type locality: Constantine Harbor, Amchitka Island, Alaska.

Collecting data: Shuyak Strait, Afognak Island, and Unalaska Island (Eyerdam); Ellamar, Alaska (Dr. Baker); Bear Bay, Peril Straits (Kate Stephens);

Odostomia angularis Dall and Bartsch,1907. Sitka, Alaska to Monterey. Type locality: Nanaimo, B.C.

Collecting data: Off Friday Harbor, Puget Sound (T. Kincaid); Monterey Bay, shore to 15 fms. (Smith and Gordon); Puget Sound (Lowe) (T.S. Oldroyd); Nanoose Bay, B.C. (Oldroyd);

Odostomia atossa Dall,1908. San Pedro, Calif.
Odostomia bachia Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 17-18, pl.2, f.7
Type locality: San Clemente Island.
Odostomia baldridgae Bartsch,1912 San Pedro, Calif.
Odostomia baranoffensis Dalland Bartsch,1909. Baranoff and Admiralty Islands, Alaska to Windfall Harbor, Alaska (Kate Stephens). Type L.: Bear Bay,Peril St.
Odostomia barkleyensis Dalland Bartsch,1910. Barkley Sound, Vancouver Id.
Odostomia calcarella Bartsch,1912. Off Santa Rosa Island in 48 fms. and off Reef Point, Orange Co. in 10 fms. (Strong). Type Loc.: off Santa Rosa Id.
Odostomia californica Dall and Bartsch,1909. Monterey Bay in 10-30 fms. (Smith & Gordon) to San Martin Island, L.C. (Baker). Type locality: Ocean Beach, Calif.

Collecting data: San Diego (Gordon); Reef Pt., Orange Co. (A.G. Smith); La Jolla (Chaney); So. Coronado Island in 4-14 fms. (Baker); on Kelletia kelletii in deep water off Catalina Island (Field) (Gregg); off Reef Point in 10 fms. (Strong);
Odostomia callimene Bartsch,1912. San Pedro, Calif. to Reef Point,Orange Co. (Strong). Type locality: San Pedro.

Collecting data: Off Reef Pt. in 10 fms. (Strong); off Point Vincente in 12 fms. (Dr. W.O. Gregg); Reef Pt., Orange Co. in 12 fms. (Gordon);
Odostomia calliope Bartsch,1912. Off La Jolla, San Diego Co. in 199 fms.
Odostomia capitana Dall and Bartsch,1909. Captain's Harbor, Unalaska to Kodiak, Alaska. Type locality: Captain's Harbor.
Odostomia cassandra Bartsch,1912. Skidegate, Queen Charlotte Islands, B.C.
Odostomia clessini Dall and Bartsch,1909. Baranoff and Admiralty Islands to Sitka, Alaska (Dall). Type locality: Bear Bay, Peril Straits, Baranoff Id.

Collecting data: Bear Bay, Peril Straits (Stephens)
Odostomia columbiana Dall and Bartsch,1907. Forrester Island, Alaska (Willett) to Puget Sound. Type locality: Victoria, Vancouver Island, B.C.

Collecting data: off San Juan Islands, Puget Sound (T. Kincaid); there is a set in the San Diego Museum collected by Dr. Fred Baker at La Jolla, San Diego Co. labelled as this species- such an extention should be checked; Puget Sound (T.S. Oldroyd); Victoria, B.C. (Eyerdam).
Odostomia cookeana Bartsch,1912. Ellamar,Alaska to Forrester Island (Willett) Type locality: Ellamar. Coll. Data: Ellamar,Alaska (Baker). /Olga,Wsn.(Gregg
Odostomia cypria Dalland Bartsch,1910. Skidegate, Queen Charlotte Ids.,B.C.
Odostomia deliciosa Dall and Bartsch,1907. Barkley Sound, Vancouver Island to **Monterey** (Smith), . Type locality: Barkley Sound.

Collecting data: Pt. Reyes (W.O. Gregg); Monterey Bay in 10-25 fms. (Smithand Gordon);(Det. by P. Bartsch, U.S.N.M.); Queen Charlotte Islands (T.S. Oldroyd);(Lowe); Ballard Beach, Seattle, Wash. (Dr. Baker);
Odostomia donilla Dall and Bartsch,1909. Santa Monica, Calif. (Burch) to San Martin Island, L.C; (Dr. Baker). Type locality: San Pedro.

Collecting data: Santa Monica, shore to 10 fms.; wharf pilings under Venice Pier and also Playa del Rey pier; Redondo Beach on Mytilus on wharf pilings; same from Crystal Pier, San Diego (Burch); San Diego (Gordon); Anaheim Bay under mussels (Chace); Reef Pt., Orange Co. and White's Pt. (A.G. Smith); San Diego (Chaney)(K. Stephens) (Baker); off Reef Pt. in 10 fms. (Strong); Pt. Reyes, Calif. (Gregg);
Odostomia edmondi E. Jordan,1920. Trinidad, California.
Odostomia esilda Dall and Bartsch,1909. Off San Diego in 359 fms.
Odostomia eyerdami Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 18-19,pl.4,f.1.

Collecting data: Shuyak Strait, Afognak Island,1924 under stones (Eyerdam);

Odostomia franciscana Bartsch,1917. San Francisco Bay, Calif.

Collecting data: S.F. Bay (Albatross, C.A.S.); drift, Alameda Pier (A.G. Smith).

Odostomia gravida Gould,1852. Monterey to San Diego. Type Loc.: Santa Barbara

Collecting data: Monterey (Cooper); San Diego(T.S. Oldroyd) (Hemphill); La Jolla (Chaney); Anaheim Bay (Lowe); Monterey (Strong);

Odostomia hagemeisteri Dall and Bartsch,1909. Hagemeister Island,Bering Sea

Odostomia herilda Dall and Bartsch,1909. Off Santa Cruz Island and off Redondo Beach (Burch) to San Diego. Type locality: San Diego.

Collecting data: off Redondo Beach in 75 fms.; off Santa Cruz Island in 50 fms. (Burch); off Catalina Island in 30-40 fms. (Strong).

Odostomia hypatia Dall and Bartsch,1912. Skidegate, Queen Charlotte Island,

Odostomia inflata Carpenter,1864. Raspberry Island, Alaska,1945 (Eyerdam) to Monterey, Calif. Type locality: Neah Bay, Wash.

Dr. A. Myra Keen advised on this name " Crediting Odostomia inflata to Dalland Bartsch in Bull. 112 was a typographical error, for it was clearly described by Carpenter and was credited to him by Dalland Bartsch in the 1907 reference." Mr. Allyn G. Smith sent in the following data: " O. inflata dates from Carpenter 1864 (Rept. British Assoc. Adv. Sci. for 1863, publ. Aug. 1864) in which he gives the usual meager description and cites the species from he Farallone Ids. (Darbishire). See Rerint, page 144. In 1865 (P.Z.S., p. 7, Reprint p. 285) he described it more fully and gave localit-ies as " Santa Barbara (Jewett); Farraleone (sic.) Islands, in cavities in Haliotis (teste R.O. Darbishire); near San Francisco (Rowell); Neah Bay (Swan)." Dalland Bartsch redescribed it, 1907."

Collecting data: Monterey (Cooper) ; Monterey (Gordon);(Lowe); Oakland, Calif. (Hemphill); Orcas Island, Puget Sound (Baker);

Odostomia io Dall and Bartsch,1909. Santa Rosa Island to San Diego(Kelsey) Type locality: Santa Rosa Island, Calif. / to Todos Santos Bay (Burch)

Collecting data: dredged off Ensenada, L.C. in 15 fms.; off Santa Cruz Island in 50 fms.; off Redondo Beach in 25-50 fms.; off Santa Monica, in 15 fms. (Burch); Newport (Gordon); Whites Point, San Pedro (Strong); Bird Rock, San Diego Co. (Baker); San Pedro and Portuguese Bend (W.O. Gregg);

Odostomia jewetti Dall and Bartsch,1907. Santa Barbara, Calif.

Odostomia kadiakensis Dall and Bartsch,1909. Kodiak Island, Alaska.

Collecting data: Kanatak Lagoon,Portage Bay, Alaska in 6 fms. (Hanna,CAS)

Odostomia killisnooensis Dall and Bartsch,1909. Killisnoo, S.E. Alaska.

Odostomia minutissima Dalland Bartsch,1909. Off Redondo Beach (Burch) to Point Abreojos, L.C. Type locality: San Diego, Calif.

Collecting data: off Redondo in 75 fms. mud bottom; off Ensenada,L.C. in 50 fms. (Burch); Ballast Point, San Diego in 8 fms. ; South Coronado Island (Baker);

Odostomia movilla Dalland Bartsch,1909. Off San Diego in 359 fms.

Odostomia nemo Dalland Bartsch,1909. Off Santa Monica (Burch) to Todos Santos Bay (Burch). Type locality: San Diego.

Collecting data: off Santa Monica in 15 fms.; off Avalon, Catalina Id. in 25 fms.; off Redondo Beach in 25 fms.; off Ensenada, Mexico in 15 fms. (Burch); San Pedro (; San Diego (Gordon); South Coronado Island in 10-14 fms. (Dr. Baker); off Reef Point in 12 fms. (Strong);

Odostomia notilla Dall and Bartsch,1909. Catalina Island, Calif. and off Point Vicente in 12 fms. (Gregg.) Type locality: off Catalina.

Odostomia nunivakensis Dalland Bartsch,1909. N. end of Nunivak Id.,BeringS.

Odostomia obesa Dall and Bartsch,1909. Monterey (Smith and Gordon) to San Pedro. Type locality: San Pedro.

Collecting data: Dredged off Redondo Beach in 75 fms.; off Point Vincente in 40 fms. (Burch); off Point Vincente in 12 fms. (Gregg); Monterey Bay, shore (Smithand Gordon); Point Vincente (Strong);

Odostomia phanea Dalland Bartsch,1907. Monterey to San Diego (Gordon).
Type locality: Monterey.

Collecting data: From backs of Haliotis at both Montereyand Morro Bay : (Burch); Monterey 0-25 fms. on rocks and backs of abalones (Smith and Gordon); Cayucos; San Diego (Gordon); La Jolla (Chaney); Montereyand near Morro (Strong);

Odostomia phanella Dall and Bartsch,1909. Santa Monica (Burch) to Todos Santos Bay (Burch). Type locality: San Pedro.

Collecting data: off Santa Monica in 10 fms.; off Redondo Beach 10-25; Punta Banda, L.C. (Burch); off South Coronado Island in 14 fms. (Dr. Baker); San Pedro (Lowe); there is a set in the San Diego Museum collected by Hemphill at Monterey with this label- it is not thought this species ranges so far n north; White's Point, San Diego (A.G. Smith); San Diego (Gordon); Isthmus Cove, Catalina Island (Strong).

Odostomia pratoma Dalland Bartsch,1909. Off Santa Cruz Island and Redondo Beach (Burch) to Catalina Island (Strong). Type locality: Santa Rosa Island in 50 fms.

Collecting data: off Redondo Beach 50-100 fms.; off Avalon, Catalina Island in 35 fms; off Santa Cruz Island in 50 fms. (Burch); off Catalina in 30-40 fms. (Strong); (Lowe).

Odostomia profundicola Dalland Bartsch,1909. Point Vicente to San Diego in deep water. Type Loc.: off San Diego in 359 fms.

Odostomia quadrae Dall and Bartsch,1910. Drier Bay, Knight Island,Alaska to Barkley Sound, Vancouver Island, B.C. Type locality: Barkley Sound.

Collecting data: Nanoose Bay, B.C.; Departure Bay, B.C. (T.S. Oldroyd); Olga Island, Puget Sound (Bakwr); Decatur Island near Olga, Wash. (Engberg).

Odostomia raymondi Dalland Bartsch,1909. Catalina Island.

Collecting data: Catalina Island 30-40 fms. (Strong) (Lowe) (; " On e lot in the Gordon collection from Monterey Bay; 2 fms., labelled cf. raymondi We are not listing this species as the identification is uncertain." (A.G. Smith).

Odostomia resina Dalland Bartsch,1909. Arch Beach, Calif. to San Diego
Type locality: Arch Beach

Collecting data: Ballast Point, San Diego dredged (Dr. F. Baker); Point Loma from Haliotis (Baker);

Odostomia santarosana Dalland Bartsch,1909. Santa Rosa Island to San Diego
Type locality: Santa Rosa Island.

Collecting data: San Diego (Kate Stephens).

Odostomia septentrionalis Dalland Bartsch,1909. Unalaska Island, Alaska

Odostomia serilla Dalland Bartsch,1909. Carpenteria, Santa Barbara Co. (W.O. Gregg) south to Todos Santos Bay (Burch). Type Loc.: Off San Diego.

Collecting data: Off Ensenada in 15 fms.; from pilings of Crystal Pier, San Diego (Burch); Newport Bay on Mytilus (Strong); San Pedro (Lowe); Ballast Point, San Diego dredged (Dr. Baker); Carpenteria, Santa Barbara Co., Venice, ol Rey. In each locality on Mytilus californicus. (W.O. Gregg).

Odostomia sitkaensis Clessin,1900. Sitka, Alaska to Japan (Baker).

Collecting data: Abashiri,Hokkaido, Japan (Dr. F. Baker);

Odostomia stephensae Dall & Bartsch,1909. Drier Bay, Pr. Wm. Snd., Alaska (Eyerdam) to Barkley Sound, B.C. Type locality: Bear Bay, Peril Straits.

Coll. Data: Bear Bay (Baker); Departure Bay, B.C.(Oldroyd);

Odostomia skidegatensis Bartsch,1912. Prince William Siund (Alaska,(Eyerdam) to Queen Charlotte Islands, B.C. to Trinidad,Calif. Type Loc.: Skidegate,B.C.

Collecting data: Crescent City, Calif. (Chace); Queen Charlotte Ids.((T.S. Oldroyd); Martaga Harbor, B.C. (Oldroyd) (Strong); Port Orchard, Kitsap Co., Wash. (Eyerdam).

Odostomia spreadboroughi Dall and Bartsch,1910. Barkley Sound, Vancouver Is. B.C.

Odostomia strongi Bartsch,1927. Proc. U.S.N.M. vol. 70, pp. 19-20, pl.4, fig.4. Type locality: " from abalone at Catalina Island."

Collecting data: Isthmus Cove, Catalina Island (Strong- paratypes); Catalina Island (Lowe); (Gordon);

Odostomia tacomaensis Dall and Bartsch,1907. Tacoma, Puget Sound, Wash.

Odostomia tenuisculpta Carpenter, 1864. Barkley Sound,Vancouver Island to Lower California. Type locality: Neah Bay, Wash.

Collecting data: From Haliotis at Avila, San Luis Obispo Co.; from Haliotis fulgens at Malaga Cove, L.A. Co.; off Santa Cruz Island in 4 fms.; off Redondo Beach 10-15 fms.; Todos Santos Bay, L.C. (Hemphill); Pt. Loma; Ocean Beach (Dr. Baker); Long Beach (Lowe); San Pedro (Oldroyd); Monterey Bay (Berry); Isthmus Cove, Catalina (Strong); Portuguese Bend (W.O. Gregg); common on backs of red abalones 3 mi N. of Ft. Ross (A.G. Smith); Monterey Bay 0-15 fms. (Smith and Gordon- Det. by P. Bartsch, U.S.N.M.); San Diego (Gordon); Carmel off abalones; San Pedro; (Gordon); According to D. & B. O. straminea is the smooth southern form.(A.G. Smith).

Odostomia thea Bartsch,1912. Malaga Cove, L.A. Co. (Burch) south to San Diego (K. Stephens). Type locality: San Pedro.

Odostomia tillamookensis Dall and Bartsch,1907. Off Tillamook, Ore. in 786 f.

Odostomia unalaskensis Dall and Bartsch,1909. Captain's Harbor, Unalaska Id., Alaska. Coll. Data: Shuyak Strait,Afgnak Id.,1924 (Eyerdam).

Odostomia valdezi Dalland Bartsch,1907. Puget Sound (Baker) south to San Diego (Kelsey) (Gripp). Type locality: Monterey.

Collecting data: Off Monterey in 40 fms. shel (Burch); Monterey Bay 10-25 fms. (Smith and Gordon- Det. by P. Bartsch, U.S.N.M.); off Santa Monica in 15 fms.; off Redondo Beach in 25 fms. (Burch).

Odostomia vancouverensis Dalland Bartsch,1910. Forrester Island (Alaska, (Willett) to Barkley Sound, B.C. Type locality: Barkley Sound.

Odostomia whitei Bartsch,1927. Proc. U.S.N.M. vol. 70, p. 19, pl.4, fig.3. Type locality: Point Firmin, Calif. Paratypes in A.M. Strong Coll.

Odostomia willetti Bartsch,1917. Drier Bay, Knight Island, Prince Wm. Snd., Alaska (Eyerdam) to Queen Charlotte Islands, B.C. (Oldroyd) (Lowe). Type locality: Prince of Wales Island, Alaska.

Collecting data: Ketchikan, Alaska (Willett);

Odostomia youngi Dall and Bartsch,1910. Barkley Sound, Vancouver Island, B.C.

Odostomia chinooki Bartsch,1927. Olga, Washington.

Collecting data: Mud Bay, Thurston Co., Wash.,1925 on Ostrea lurida (Eyerdam); Olga, Wash. (Strong).

Subgenus Amaura Moller,1842. Type (by monotypy), Amaura candida Moller. Dr. A. Myra Keen advises though as follows " Amaura Moller,1842 is preoccupied by Amaura Geyer,1837 "

" Very large, usually inflated Odostomias , the sculpture of which consists of very fine lines of growth and still finer wavy closely placed spiral striations." (Dall and Bartsch,1909, p. 218).

Odostomia arctica Dall and Bartsch,1909. Seahorse Islands, Arctic Ocean south to Bristol Bay, Bering Sea. Type locality: Hagemeister Island, Bering S.

Odostomia avellana Carpenter,1865. Neah Bay, Wash. to San Martin Id., L.C (Baker). Type locality: Neah Bay.

Collecting data: Orcas Island, Puget Sound in 10-30 fms.; San Martin Island, L.C. (Dr. F. Baker); Olga, Wash. (Engberg) (Gregg).

Odostomia beringi Dall,1871. Norton Sound, Alaska.

Odostomia canfieldi Dall,1908. Barkley Sound to San Martin Island, L.C. (Baker). Type locality: Monterey.

Collecting data: Victoria, B.C. (Eyerdam); Monterey Bay, drift and 0-40 fms. (Smith and Gordon) (Iden. P. Bartsch, U.S.N.M.); White's Point; 125 f. off La Jolla (Gordon); San Martin Id., L.C.; Ocean Beach; So. Coronado Id. (Dr. F. Baker); Olga, Wash. (Engberg- Gregg).

Odostomia eldorana Bartsch,1912. Kodiak, Alaska.

Odostomia elsa Dall and Bartsch,1909. Kodiak Island, Alaska. Redondo(Burch)

Odostomia engbergi Bartsch,1920. San Juan Islands, Gulf of Georgia.

Collecting data: Olga Washington (Engberg);

Odostomia farallonensis Dall and Bartsch,1909. Farallone Islands to off Redondo Beach, Calif. (Burch). Type Locality: off the Farallone Islands.

Mr. A.M. Strong comments on this species as follows: " About the only difference between this and A. helena Bartsch is in the amount of shouldering to the whorls and the locality. It is doubtful if a satisfactory separation of the two could be made without type or topotype material to work with. The range is open to question."

Collecting data: Monterey Bay (Keen); off Redondo Beach in 25-100 fms. and off Avalon, Catalina Island in 35 fms. (Burch);

Odostomia gouldii Carpenter,1864. Neah Bay, Wash. south to San Diego Type locality: Neah Bay, Wash.

Collecting data: San Diego (Dr. F. Baker) (Gripp); off Friday Harbor, Wash. (T. Kincaid) (Burch).

Odostomia grippiana Bartsch,1912. Nanaimo, B.C.

Odostomia helena Bartsch,1912. Off Redondo Beach (Burch) to San Pedro an Catalina Island. Type locality: San Pedro.

Collecting data: Dredged off Malaga Cove in 15 fms.; off Redondo Beach in 15-50 fms.; off Avalon, Catalina Island in 25 fms. (Burch); Catalina in 35 fms. (Lowe)

Odostomia iliuliukensis Dall and Bartsch,1909. Unalaska Island, Alaska.

Collecting data: Iliuliuk Harbor, Unalaska Id. (Eyerdam);

Odostomia kennerlyi Dall and Bartsch,1907. Sawmill Bay, Prince Wm. Sound, Alaska (Gordon) south to Monterey, Calif. Type Loc.: Nanaimo, B.C.

Collecting data: Ballard Beach, Seattle, Wash. (Eyerdam); Sitka,Alaska (Gordon); Puget Sound (Oldroyd); Monterey Bay in 10-30 fms. (Smith & Gordon); Santa Catalina Island- 1 large spec. (Lowe);

Odostomia krausei Clessin,1900. (krausei) Kodiak to Killisnoo,Alaska Type locality: Verbretung, Japan.

Collecting data: Shuyak Strait, Afognak Id., Alaska (Eyerdam);

Odostomia lastra Dall and Bartsch,1909. Catalina Island to San Diego,Calif. Type locality: U.S.B.F. Sta. 2917, in 90 fms. off southern Calif.

Odostomia martensi Dall and Bartsch,1906. Killisnoo, Alaska.

Odostomia moratora Dall and Bartsch,1909. Off Point Reyes, Calif.

Odostomia nota Dall and Bartsch,1909. Santa Rosa Island to San Diego. Type locality: San Diego.

Collecting data: Mr. A.M. Strong recently told me that this species is to be collected by pulling up the eel grass by the roots and found deep in

(con.)

the roots, perhaps as deep as six inches. (Burch); White's Point, San Pedro; Point Loma, San Diego in grass grown tide pools (Strong); San Diego (Kelsey) (Gordon); San Pedro (Chace)(Lowe); Anaheim Bay (Chace); Pt. Loma (Baker); White's Pt. and Reef Pt., Orange Co., common in eel grass roots at minus tides (A.G. Smith); San Pedro (Gragg).

Odostomia nuciformis Carpenter,1864. Neah Bay, Wash. to San Diego. Type locality: Neah Bay. Collecting data: San Diego; Pacific Beach; off Coronado Hotel in 10 fms. (Dr. F. Baker); La Jolla (Bristol)(San Diego Museum).

Odostomia orcia Dall and Bartsch,1909. Santa Rosa Island to San Diego. Type locality: Santa Rosa Island.

Collecting data: off Santa Monica in 5 fms.; off Malaga Cove in 10 fms.; off Redondo Beach in 25 fms. (Burch- Det. by A.M. Strong); off Catalina in 30-40 fms. (Strong); San Diego (Baker) (Kelsey); Pt. Loma (K. Stephens); La Jolla (Chaney); " with nota in eel grass roots, Reef Pt., Orange Co., but scarce. There is some doubt about this identification as no typical specimens of orcia have been available for comparison (A.G. Smith);

Odostomia pesa Dall and Bartsch,1909. Shuyak Strait,Afognak Island,Alaska (Eyerdam) to Kodiak Island. Type locality: Kodiak Island.

Odostomia sanjuanensis Bartsch,1920. San Juan Islands, Gulf of Georgia

Collecting data: off Friday Harbor (Oldroyd);

Odostomia satura Carpenter,1864. Neah Bay, Wash. to San Diego. Type locality: Neah Bay.

Collecting data: San Diego (Baker) (Gordon); Olga, Wash. (Engberg-G Gregg); San Pedro and Catalina Island (Lowe);

Odostomia sillana Dall and Bartsch,1909. Captain's Bay,Unalaska Island, Alaska.

Odostomia subglobosa Bartsch,1912. San Diego and Coronado Islands in to/ 15 fms. (Gordon). Type locality: San Diego./Monterey 20f(Burch) Det. Strong

Odostomia subturrita Dall and Bartsch,1909. Santa Barbara, Calif. to Todos Santos Bay. Type locality: San Pedro.

Collecting data: Dredged off Santa Monica, Calif. in 10 fms. (Burch- Det. by A.M. Strong); San Diego (Gordon); La Jolla in 125 fms. (Gordon); White's Point, San Pedro and Point Loma, San Diego in grass grown tide pools (Strong); off Coronado Hotel in 10 fms. (Baker); San Pedro (Baker)(Lowe). White's Point (Gragg).

Odostomia talpa Dall and Bartsch,1909. Drier Bay, Knight Island and Raspbery Island, Alaska (Eyerdam) to Maple Bay, Vancouver Island, B.C. (Bartsch, Nautilus, vol. 24, p. 114). Type locality: Mole Harbor, Alaska.

Collecting data: Departure Bay, B.C. (Oldroyd); Windfall Harbor,Alaska (K. Stephens); off Friday Harbor (T. Kincaid) (Burch).

Odostomia washingtonia Bartsch,1920. (Odostomia washingtona Bartsch,1927- Proc. U.S.N.M. vol. 70, pp. 20-21, pl.4, f. 10). Type locality: off San Juan Islands, Gulf of Georgia.

Subgenus Heida Dall and Bartsch,1904. Type (by original designation), Syrnola caloosaensis Dall.

" Shell without axial or spiral sculpture beyond mere lines of growth and exceedingly fine spiral striations; peritreme continuous, aperture rissoid." (Dall and Bartsch,1909, p. 231).

Odostomia kelseyi Bartsch,1912. San Diego.

Subgenus Odostomia s.s.

Odostomia farella Dall and Bartsch,1909. Off Long Beach, Calif.

Odostomia dinella Dall and Bartsch,1909. Off Redondo, Calif.

Collecting data: off Redondo in 25 fms. (Burch)

Odostomia coronadoensis Dalland Bartsch,1909. Off Coronado Beach,San Diego.

Odostomia orcutti Bartsch,1917. San Diego, Calif.

Additions and Corrections

Subgenus Menestho

Odostomia aequisculpta Carpenter,1864. Dall and Bartsch place it under the subgenus Menestho - p. 191, 1909. Dr. A. Myra Keen adds it to our fauna on a listing by Eric Jordan who gave the range from San Diego southward in Bull. So. Calif. Acad. Sci. vol. 23, pt. 5 (Oct. 25,1924), pp. 145-140.

Genus Pyramidella

Subgenus Longchaeus (Supplementing data on page 20- this issue)

The following data from Mr. A.G. Smith.

Pyramidella (Longchaeus) adamsi Carpenter- Monterey, Calif. a young specimen (D. & B.). Dall and Bartsch say that this shell is smaller and more slender than the typical form and may prove to be a new species. This record has not subsequently been confirmed by dredging by Gordon, Hanna or myself.

Pyramidella (Longchaeus) mexicanus Dall and Bartsch - Terminal Island,San Pedro (A.G. Smith); San Diego (T.S. Oldroyd).

Odostomia (Evalea) pratoma Dalland Bartsch- See p. 43- this issue.

The following note from Mr. A.M. Strong was overlooked " This seems to be plentiful in deep water. In the description it is said to sometimes have a faint umbilical chink but it is placed in the key as not umbilicated. In your series some specimens seemto have a distinct open umbilicus. The deeply sunken nucleus giving the shell a truncated appearance is distinctive."

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A few of the more important references to consult in studying this group follow. The Dall and Bartsch and later the Bartsch papers contain many very fine keys to both genera and species.

Dall and Bartsch, " Synopsis of the Genera, Subgenera, and Sections of the Family Pyramidellidae," Proc. Biol. Soc. Washington, vol. 17, pp. 1-16, Feb. 5,1904.

✓Dall and Bartsch: " Notes on Japanese, Indo-Pacific,and American Pyramidellidae", Proc. U.S.N.M., vol. 33, pp. 321-369, pls. 17-26, 1906.

✓Dalland Bartsch: " The Pyramidellid Mollusks of the Oregonian Faunal Area", Proc. U.S.N.M., vol. 33, pp. 491-534, pls. 44-48, Dec. 31,1907.

✓Dall and Bartsch: " A Monograph of West American Pyramidellid Mollusks", U.S. Nat. Mus. Bull. 68, 258 pp, 30 pls.,1909.

✓Bartsch, Paul : " Pyramidellidae of New England and the Adjacent Region", Proc. U.S.N.M., vol. 34, no.4, pp 67-113, pls. 11-14, Feb. 1909.

✓Bartsch, Paul : " Additions to the West American Pyramidellid Mollusk Fauna, with Descriptions of New Sp cies.", Proc. U.S.N.M., vol. 42, pp. 261-289, pls. 35-38, May 17,1912.

✓Bartsch, Paul : " New West American Marine Mollusks", Proc. U.S.N.M. No. 2660, vol. 70, pp. 1-36, pls. 1-6, 1927.

Minutes of the Long Beach Shell Club- May,1946 meeting

The Long Beach Shell Club was called to order by the president, Mr. Baker at 2:40 P.M., May 12, in the Children's Room of the public library.

The minutes were read and accepted. A member told of meeting Mr. Kanakoff, who has a new shell interestand will tell us about it in the future. Five members of the club will arrange for a meeting to list and catalog topical material in the numerous magazines the club has at the librarians home so each may have a list.

Mr. Ulrich and Mr. Chace reported good collecting at Point Firmin and Pt. Vicente- *Gadinia reticulata, Acmaea scabra, Antigona fordi* and *Astraea undosa.* A very large specimen of *Lottia gigantea* was found too. Dr. Lloyd at the San Pedro museum is increasing that collection very greatly.

Program chairman, Mrs. Libby, graciously introduced Dr. Dunkle, who took the topic " Fossil Shells in the Long Beach Schools". He told how the study of shells was taken up in the elementary division by individual teachers, but that in the Junior and Senior High Schools there was no definite place for it, and the large amount of new material there, where interest might be aroused due to the age level, crowded out the subject. As a part of the work in Junior College, in a shell club and in the study of geology there is a definite place, but the fossil shells are the ones studied, showing the relationship of shells to the different life strata and aiding in interpretation of changes ih life. Among points brought out are the following: Mollusks and Brachiopods are found at life's beginning; with each emergence of earth from shallow seas, competition in life groups produced variations; large fossil Ammonites were present in abundance in the Jurrasic times, good examples having been available at Friday Harbor. He reported that his science club has found Pleistocene fossils, 90% of them being modern shells; that representatives of the Cretaceous timeare present in Silverado Canyon, and that a few Ammonites were located in the Santa Ana Hills, west of this canyon. Club members reported finding of fossil shark's teeth in Hilltop Quarry, San Pedro, and immensely large Ammonites in Carmel,Utah.

We all appreciated Dr. Dunkle's talk, and found great pleasure in examining the large number of specimens so beautifully mounted. It might be of interest to others not present, that this group dyed the cotton background blue, which made the specimens show much better.

After announcing the talk by Mr. Bailey on " Collecting on the Great Barrier Reef" for next month, Mr. Baker adjourned the meeting.

Ruth E. Eaton, Secretary.

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The interesting monthly bulletin of the Auckland Museum Conchology Club is at hand for their March meeting. Our New Zealand friends are doing some very fine work.

With the notes of their meeting an interesting letter arrived from Mrs. Ida Worthy, Patumahoe, Auckland, New Zealand. Those interested in exchanges will find Mrs. Worthy a valuable correspondent.

The monthly bulletin for May of the Natural History Museum of San Digo is at hand. Among other interesting notes is one by Dr. Mayr who estimates the approximate number of known species as follows: Mollusks,88,000; Mammals 3,500; Reptiles and Amphibians 5,500; Fishes, 18,000;Insects, 750,000; Crustaceans,25,000. We note with a bit of envy that Mr. Karl W. Kenyon with Woody Williams are on a trip down the coast for several months collecting in Kenyon's auxiliary powered sail boat " The Seven Seas.";

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
August 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or more.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965

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Turridae

We passed up this family group hoping to have Dr. Bartsch's monograph in hand by the time we had completed the other groups. Mr. Allyn G. Smith is preparing our report on the Amphineura. It seems that we may as well include our locality records and all data we have on the Turridae. There is no doubt but that Dr. Bartsch will make many changes in the nomenclature. It seems to be generally agreed that Dr. Dall's usage will have to be changed materially, probably by the addition of a great many more genera.

A few of the more important recent works on the Turridae follow:
Powell, A.W.B. " The New Zealand Recent and Fossil Mollusca of the Family Turridae", Bulletin of the Auckland Institute and Museum, No. 2. In this work Dr. Powell gives a list " Synopsis of Turrid Generic Names" in which he gives the type species and synonymy. His data will be freely used in this paper.
Bartsch, Paul and Rehder, Harald Alfred " Mollusks Collected on the Presidential Cruise of 1938", Smithsonian Miscellaneous Collections, vol. 98, no. 10. .
Bartsch, Paul and Rehder, Harald A. " New Turritid Mollusks from Florida", Proc. of the U.S. Natl. Mus., vol. 87, no. 3070, pp 127-138, pl. 17.
Bartsch, Paul, " The Nomenclatorial Status of Certain Northern Turritid Mollusks" Proc. of the Biological Soc. of Washington, vol. 54, pp. 1-14,Feb.26,1941.
Bartsch, Paul, " Some Notes Upon West American Turrid Mollusks.", Proc. Biol. Soc. Wash., vol. 57, pp. 25-30, June 28,1944.
Bartsch, Paul, " Some Turrid Mollusks of Monterey Bay and Vicinity", Proc. Biol. Soc. Wash., vol. 57, pp. 57-68, Oct. 31,1944.
Bartsch, Paul, " The West Pacific species of the molluscan genus Aforia.", Journal of the Washington Academy of Sciences, vol. 35, no. 12, Dec. 15,1945.

The following note from Dr. Paul Bartsch will be of interest:" I have gone over your MS and have put in a few notes (a very few). I am enclosing several small papers which will help you to partly understand the complexity of the problem. There are today close to 500 genera known in the family and most of the names for the larger groups have been terribly abused. I believe as I stated to you before, The thing is a complete mess which I hope my studies of the anatomic structures as far as available, will help to clear up. I have finished two of the three subfamilies and am deep in the third. The part fin-

(con.)

-i[illegible] [illegible] a two-foot space on my shelves holding the manuscript in folders, so you see it is not just a simple matter of making a few changes in the list of names that you have but I hope that the thing that I am doing will furnish a new basis for a more sound classification. Most of the groups are not restricted to the west coast of America, but are present in other parts of the world and therefore assume an entirely different aspect from that which we would glean if we were dealing with east Pacific forms only. However, I don't wish to enter into a long discussion of this problem at the present time, but merely make this statement to point out that it would be impossible for me to give you a revision even of the parts finished at the present time. I wish that the entire paper were finished so that you could have the concept as I see things, but there are a good many things in our daily routine that keep one from working at a thing steadily."

As observed above no two authors seem to agree on the nomenclature of this family. However, the following keys to genera and subgenera should be of some interest. They are taken from Mr. A.M. Strong's notebook.

Partial Key to Genera and Subgenera of Turridae
(All northern and deepwater shells omitted)

Anal sulcus very faint or absent
. Whorls angulated by a strong peripher cord or keel ....Kurtziella
. Whorls not angulated
... Aperture longer than the spire ....Mitramorpha
... Aperture not as long as the spire
.... Shell slender .... Mangelia
.... Shell stout .... Ishnula
Anal sulcus distinct
. Posterior angle of aperture thin edged, without armor
.. Anal sulcus at or near the suture
... Anal sulcus shallow, rounded
.... Aperture narrowing anteriorly to a short canal ..... Knefastia
.... Aperture widening anteriorly, without canal .... Daphnella
... Anal sulcus deep
.... Periphery of whorls frilled .... Ancistrosyrinx
.... Periphery of whorls not frilled ....Fusiturricula
.. Anal sulcus some distance below the suture
... Anal sulcus deep, on a spiral rib .... Polystira
... Anal sulcus shallow, triangular
.... A sculptured band between fasciole and suture ....Pseudomelatoma
.... A smooth band between fasciole and suture ....Moniliopsis
. Posterior angle of aperture thickened or armored
.. Anal fasciole present
... Interior of outer lip smooth
.... Inner lip smooth, more or less erased
..... Outer lip varicose
...... Varix extending around the sulcus to the suture.... Agathotomia
...... Varix not reaching the suture ....?. Ithyeythara
..... Outer lip not varicose, anal sulcus projecting .... Nannodiella
.... Inner lip ending posteriorly in a callus pile
..... Outer lip not varicose
...... Anal fasciole adjoining the suture
.... Spiral sculpture fine or absent, axial ribs strong

(con.)

.... Interspaces between ribs smooth .... Cymatosyrinx
.... Interspaces spirally striate
.... Back of last whorl swollen, without ribs
.... Shell large, over 25 mm. in length .... Elaeocyma
.... Shell small, less than 20,, in length .... Syntomodrillia
.... Axial ribs extending over the back of the whorls. Clathrodrillia
.... Incised spiral lines cutting the ribs .... Kylax
.... Spiral keels riding over the weak axial ribs ...Carinodrillia
...... Anal fasciole separated from the suture by a sculptured band
.... Axial ribs strong, extending from fasciole to canal
.... Spiral sculpture of fine striae in interspaces.. Crassispira
.... Spiral cords distinct, riding over the ribs
.... Whorls shouldered ....Brachytoma
.... Whorls not shouldered ....Crassispirella
.... Axial sculpture weak or absent, spiral cords strong. Monilispira
..... Outer lip varicose, the edge thin .... Lioglyphostoma
..... Outer lip internally dentate
...... Canal very short, ill defined .... Clathurella
...... Canal distinct, slightly curved backwards ....Glyphostoma
.... Anal fasciole absent
..... Inner and outer lip smooth .... Brophodrillia
..... Inner and outer lip dentate or lirate .... Zetekia

Key to Genera and Subgenera of Turridae as Defined by Grant and Gale

Notch armored, with a callus pile at the top of the inner lip
. Outer lip thickened and dentate in the adult .... Clathurella
. Outer lip without denticles
.. Notch indistinct ....Bellaspira
.. Notch deep, rounded .... Clavus
... Whorls with a conspicuous subsutural band ....(Crassispira)
... Whorls without a subsutural band
.... Sculpture confined to a spiral row of nodes .... (Clavus s.s.)
.... Axial sculpture of elongated nodes or ribs
..... Spiral sculpture of strong cords ....(Clathrodrillia)
...... Shell with a high spire and short canal .... (Cymatosyrinx)
...... Shell with a shorter spire and moderate canal
......Spiral sculpture of very fine lirae or none
.... Axial ribs ten or more ....(Brachytoma)
.... Axial ribs less than ten, very coarse ....(Drillia)

Notch unarmored
. Notch on a peripheral angle or cord.
.. Sculpture of incised spiral lines and lines of growth only-Moniliopsis
.. Sculpture of spiral cords and lines of growth
... Canal moderate to long ....Turris
.... Anal fasciole smooth ....(Turris s.s.)
.... Anal fasciole beaded ....(Gemmula)
... Canal short but well defined (deep water) ....Pleurotomoides
... Canal ill-defined .... Taranis
. Notch separated from the suture by a sculptured band
.. Canal parallel sided, produced .... Turricula
... Shell elongate, large ....(Turricula s.s.)
... Shell fusiform, canal long .... (Pleurofusia)
.. Canal short or indistinct

(con.)

... Notch moderately deep, rounded .... Clavatula
.... Subsutural band coarsely sculptured .... (Clavatula s.s.)
.... Subsutural band moderately sculptured .... (Knestia)
.... Subsutural band rather inconspicuous .... (Trchhylochetus)
... Notch shallow, triangular .... Pseudomelatoma
.... Entire spire sculptured ....(Pseudomelatoma s.s. .)
.... Sculpture on tip of spire only ....(Laevitectum)
. Notch at or near the suture, without sutural band
.. Sculpture of rounded nodes or faint or wanting
... Aperture and canal about ½ length of shell ....Surculites
.... Whorls sharply angulated, tabulate .... (Surculites s.s.)
.... Whorls rounded or slightly turrited .... (Megasurcula)
... Aperture and canal about one third length of shell ...Spirotropis
.... Whorls sculptured with nodes on angulated shoulder..(Typhomangilia)
.... Whorls smooth except for lines of growth
..... Whorls rounded, often sinistral .... (Antiplanes)
..... Whorls angulated at the shoulder
...... Columella gentle flexuous, without plaits ....(Spirotropis s.s.)
...... Columella nearly straight, often plicate ....(Borsonella)
.. Sculpture distinct
... Shell medium to large, canal distinct
.... Periphery angulated, a nodose keel on the angle ....Ancistrosyrinx
.... Whorls shouldered or keeled (abyssal) .... Leucosyrinx
..... Axial sculpture present ....(Surculina)
..... Axial sculpture absent
...... Shoulder of whorls nodose ....(Leucosyrinx s.s.)
...... Shoulder of whorls not nodose
.... Spiral sculpture of strong cords .... (Steiraxis)
.... Spiral sculpture of fine striae
.... Notch near the suture ....(Aforia)
.... Notch remote from the suture ....(Suavodrillia)
... Shell medium to small, canal short or ill defined
.... Axial sculpture of lines of growth only, spiral cords..Teres
.... Axial sculpture of raised striae or ribs
..... Axial and spiral sculpture of fine, equal striae ...Daphnella
..... Axial sculpture of elongated nodes or ribs
...... Notch deep and rounded
.... Canal short, curved, notched behind (abyssal)...Pleurotomoides
.... Canal short, straight, not notched (abyssal)... Borsonia
...... Notch a narrow slit, or shallow or obsolete
.... Northern, or cold water species .... Lora
.... Southern or temperate and warm water species .... Mangelia
.... Notch obsolete at all stages, shell biconic .... (Mitromorpha)
........Notch shallow, rounded in the adult
.... Axial ribs few, distant ....(Mangelia s.s.)
.... Axial ribs closer, more irregular .... (Bela)
.... Notch deep, slit-like
.... Axial ribs wave-like, spirally grooved .... (Agathotoma)
..........Sculpture of axial ribs and spiral cords ...... (Zetekia)

Genus Megasurcula Casey,1904 (p. 147). Type (s.d. Grant and Gale,1931, p. 495): Pleurotoma (Surcula) carpenteriana Gabb. Pliocene-Recent.

Dr. Dall in Bull. 112 used the generic name Cryptoconus von Koenen,1867 (p. 211). Type (s.d. Cossmann,1889, p. 235): Pleurotoma filosa Lamarck.Eocene

Other authors have more recently been using the name Surculites Conrad,1865 (p. 213): Type (monotypy): Surcula annosa Conrad. Eocene, New Jersey. Doubtfully Turrid according to Wrigley,1939.

A synonymy of the various names applied to this group by different authors would be rather extensive.

Mr. A.M. Strong comments: " Megasurcula seems to be a good genus but restricted to our shells. They are so variable that I do not see how they can be divided into separate species or even varieties."

Dr. Joshua L. Baily Jr. comments " You are quite right in using this name, but I do not think it should be made a genus. I shall continue to use Surculites until someone convinces me that this is undesirable. I agree with you in making many species of this group subspecies of carpenteriana."

Megasurcula carpenteriana (Gabb),1865. Bodega Bay to Cerros Island, Mexico. Type locality: " not specified- advice of Dr. Keen).

A number of subspecies have been described almost entirely based on a difference in the nodulations. It is my opinion that we have but two distinct species on this coast, and that these nodulations will intergrade right down to the smooth form of carpenteriana in a large series. I think that I can show this in my collection after having collected them by the thousands. " (Burch). The above comment was approved by Mr. E.P. Chace and other members.

Collecting data: Dredged in from 15 to 50 fms. off Redondo Beach,Santa Monica, San Pedro, and down to Todos Santos Bay. Seems to be in greatest numbers around 30 fms. Prefers mud bottom. Will commonly get in crab and lobster traps. (Burch); off Newport in 35 fms.; same from Drake's Bay (Lowe); Lower Calif. (Capt. Porter);

Megasurcula carpenteriana tryoniana (Gabb),1866. Santa Monica Bay to San Martin Island. Type locality: Post-Pliocene of San Pedro. The majority are disposed to simply place all of these subspecies in the synonymy of the typical. However, we will give the names, collecting records and range for the convenience of those who disagree.

Collecting data: San Pedro from fishermen's nets; off Newport in 35 fms.; (Lowe); Lower Calif. (Capt. Porter).

Megasurcula carpenteriana tremperiana (Dall),1911. Point Ano Nuevo,Calif. to Cerros Island. Type locality: off San Pedro.

Collecting data: off Newport in 35 fms. from halibut nets (Lowe);

Megasurcula carpenteriana granti Bartsch,1944. Proc. Biol. Soc. Wash., vol. 57, pp. 60-61. Range: Monterey to San Pedro, Calif. Type locality:Monterey Bay.

Dr. Bartsch described this species as a distinct species on the difference in nodulations, for this reason alone distinguishing it from M. carpenteriana, M. c. tremperiana etc. We commented on these above. The original description, however, follows:

In the synonymy Dr. Bartsch places : Pleurotoma (Genota) carpenteriana Raymond, Nautilus, vol. 20, pl.2, fig. 3.

" Shell very large, spindle shaped, of dingy yellowish ground color with the spiral bands on the last whorl chestnut brown. Nuclear whorls about 2, small, well rounded, smooth. The early postnuclear whorls show the sinal depression. Beginning with about the third postnuclear whorl, the weak nodules at the anterior termination of the sinal area make their appearance. These extend over about 1.5 whorls, about 14 being present. On the succeeding turns the nodulations disappear. The sinal area on the last whorl is concave and the rest of the whorl, base and columella are convex. The outline of the base and columella on the left side is concave. The last two whorls are marked by very fine spiral lirations on the sinal area and little coarser threads anterior to this which gradually become stronger on the base. Here the moderately strong spiral threads are separated by three or four more slender threads, the heavier ones corresponding to the dark lines. The axial sculpture consists of rather rough incremental lines. There is a strong basal fasciole, which is marked by more or less concentric rough rugations. Aperture large, oval. Posterior sinus, of the outer lip broad and shallow. Anterior to the posterior sinus the outer lip is protracted. The inner lip shows decided resorpstion on the columella which also extends up on the parietal wall."

" This species belongs to the nodulose group of Megasurcula, i. e. M. tryonianus Gabb, M. cooperi Arnold, M. keepi Arnold, and M. tremperiana Dall. It differs from the last three in having the nodulations pronounced only on the early postnuclear whorls and absent on the last, and from tremperiana by its much larger size. "

Megasurcula remondii (Gabb),1866. Geol. Survery of Calif. , Palaeo., vol.2, p. 3, pl. 1, fig.5, 1866. In the synonymy: Pleurotoma (Genota) stearnsiana Raymond, Nautilus, vol. 18, p. 1, 1904; vol. 20, p. 38, pl.2, figs. 4,5,6.1906.

Grant and Gale, 1931, pp. 495-497 make an excellent case for Gabb's species.

Range: Monterey, Calif. to Todos Santos Bay (Burch). Type locality: Pliocene, Tomales Bay.

Collecting data: Our experience has been to find this a distinct form easily distinguished from the forms of carpenteriana. It is much less common and it is interesting that we have always taken it from gravel bottom while the above species seems to prefer mud.or very fine sand. (Burch); off Redondo Beach in 25 fms.; off Santa Mojica in 20 fms.; off Rocky Point in 40 fms/; off Ensenada, L.C. in 50 fms. (Burch); off Catalina in 30 fms. (Lowe); XXXX San Diego Bay- dredged (Gripp).

Genus Aforia Dall,1889. Bull. Mus. Comp. Zool. 18:99,1889. Type (o.d.): Pleurotoma circinata Dall,1873.* insignis Jeff. Figured in Bull. 112.

Grant and Gale considered this a subgenus of Leucosyrinx Dall,1889. However, this does not seem to have been generally accepted. Dr. Bartsch published a paper on the species of the west Pacific- reference above.

" This group has the shell of a typical Pleurotoma , but has no operculum; the typical species reaches three or four inches in length, is strongly carinated above the periphery, and the wide rather deep anal sulcus is nearer to the carina than to the suture." (Dall).

Aforia circinata Dall,1873. Bering Sea (lat. 62 29') to Fuca Strait. Type locality: Nateekin Bay, Captain's Bay, Unalaska. Izhut Bay,Alaska(Eyerdam).

Genus Leucosyrinx Dall,1889.(p. 75). Type (o.d.): Pl. verrilli Dall. Recent, North Carolina to Gulf of Mexico 150-860 fathoms.

" Shell moderately large, thin, white or pale, with impervious axis, the sculpture chiefly of delicate spiral threading with feeble axial riblets at the shoulder; anal fasciole wide, shallow, next the suture; canal moderately long, distally flaring; th pillar thick, anteriorly obliquely truncate; operculum subovate, acute in front, with a medial thickened rib on the inner face, the area of attachment small, the nucleus apical." (Dall).

Leucosyrinx kincaidi Dall,1919. Shelikoff Straits, Alaska.
Leucosyrinx amycus Dall,1919. Off Monterey in 871 fms.
Leucosyrinx persimilis Dall,1889. Cortez Bank to Magellan Strait.

Dr. A.M. Keen advises on this species: " L. persimilis was described in 1889. No type locality was selected; localities in Chile and Ecuador were cited." Proc. U.S.N.M. 1889, p. 301, pl.6, fig.3.

Dall gives the range as : Abyssal, Eastern Pacific.

Leucosyrinx persimilis blanca Dall,1919. Off Cape Blanco, Oregon in 1064 fms.
Leucosyrinx persimilis leonis Dall,1908. Off Sealion Rock, Wash. to Cortez Bank, Calif. in deep water. Type locality: Off the coast of Washington in 877 f.

Genus Irenosyrinx Dall,1908. (p. 257). Type (o.d.): Pl. (Leucosyrinx) goodei Dall. Grant and Gale,1931, p. 508 make a very good case for their contention that this genus should be placed in the synonymy of Aforia.

" Shell large, thin, fusiform, white, with a keel at the shoulder; sculpture feeble, wholly spiral; anal sulcus wide, shallow, nearer the shoulder than the suture ; axis pervious, aperture and canal longer than the spire; outer lip produced, thin, simple; canal elongate, pillar obliquely truncate; operculum in the young paucispiral. later the paucispiral nucleus is surrounded by concentric additions, leaving the nucleus subcentral, or a little anterior to the right, in an elliptical concentric operculum without internal rib, with a large area of adhesion, and an outline in general like the operculum of Buccinum " (Dall).

Irenosyrinx crebristriata(Dall)1908. Southwest of Sitka, Alaska in 1569 fms.

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Genus Morrisonella Bartsch,1945. Family: Buccinidae. Type: (o.d.), Leucosyrinx pacifica Dall,1908. Albatross Sta. 2859 in 1569 fms. on ooze bottom southwest of Sitka, Alaska.

Described by Dr. Paul Bartsch in Nautilus 59:23, pl.3, figs. 11-14,July, 1945. " The animal of the holotype is without eyes,and is a male and shows a huge verge (fig.14). The radula consists of 3-cusped rachidian teeth (fig.) 12 and 2- cusped marginal teeth (fig.13)."

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Genus Elaeocyma Dall,1918. Type (o.d.): Drillia empyrosia Dall. Recent, southern California. Proc. U.S.N.M. no. 2238, vol.54,p. 317,1918.

" The light colored species, with an oily gloss, thin shells, and prominent riblets usually crossed by rather widely spaced spiral striations will take the new name of Elaeocyma Dall. This group appears to be peculiar to the Pacific coast of America."

Our west coast species in this genus have been rather generally called Cymatosyrinx Dall,1889 (p. 95). Type (o.d.): Pleurotoma lunata Lea. Miocene, Virginia. Figured by Grant and Gale,1931, pl.26, fig.7. This was used by Dr. Dall in Bull. 112, with Elaeocyma as a subgenus.

Grant and Gale were disposed to use the genus Clavus Montfort,1810 (p. 434). Type (o.d.): C. flammulatus Montfort. Recent, West Africa. They then considered Cymatosyrinx a subgenus of Clavus.

Mr. A.M. Strong comments on this problem as follows: " I consider Cymatosyrinx a good genus, but do not think it contains any species from San Diego or north. Clavus might be used as a subfamily. The typical genus s.s can hardly be used for any west coast species. Elaeocyma Dall is a good

(con.)

genus with but the one species from California. The genus [illegible] which is very similar if not identical. Hemphilli Stearns and halocydne Dall are the northern representatives of a large southern group. They probably belong in a subgenus under Elaeocyma , but I can find no name for it. They are much smaller and more slender than the typical form."

Dr. Dall in Bull. 112 listed a species Cymatosyrinx johnsoni Arnold,1903 described from the San Pedro Pleistocene. I have been unable to locate any Recent records of this species and am therefore proposing to drop it from our faunal list.

Elaeocyma empyrosia(Dall)1899. Off Redondo Beach (Burch) to Todos Santos Bay (Burch). Type locality: off San Pedro in deep water.

Collecting data: Dredged off Redondo Beach in 25-50 fms.; off Avalon Catalina Island in 25 fms.; off Todos Santos Islands in 50 fms. (Burch); off Catalina Island in 30 and 50 fms. (Lowe).

Elaeocyma hemphilli(Stearns),1871. Santa Barbara to Gulf of California. Type locality: Todos Santos Bay.

Collecting data: We dredged a number of specimens apparently of this species off Redondo Beach and Malaga Cove. Mr. George Willett classified them as hemphilli var. aeolia Dall. However, aeolia is a southern form and I hesitate to add it to our list without further checking. Furthermore I note that Mr. A.M. Strong considers aeolia a distinct species from the Gulf and Tres Marias Islands. Dall described it as Elaeocyma aeolia in Proc. U.S.N.M., no. 2288, vol. 56, p. 11, pl.3, fig.1.(Burch); typical specimens dredged in great abundance at the type locality in Todos Santos Bay in approximately 10-15 fms.; also taken littoral at low tide from the sand bars in the Estero below Ensenada; off Santa Monica, Calif. in 15 fms. (Burch); San Diego in 10 fms. (Kelsey); San Pedro in 10 fms.; Estero de Todos Santos Bay (Lowe); Scammon's Lagoon (Hemphill).

Elaeocyma halocydne Dall,1919. San Pedro and the Santa Barbara Islands (Dall). Also off Redondo Beach (Burch). Type locality: off San Pedro.

Collecting data: off Redondo Beach in 25 fms. gravel bottom; off Ensenado, Mexico in 50 fms. (Burch); San Pedro in 30 fms.; Catalina in 25 fms.; (Lowe).

Genus Clathrodrillia Dall,1918 (p. 317). Type (o.d.): Pleurotoma gibbosa Reeve= P. gibbosa Kiener. Recent, Indian Ocean.

" For the generally brown or brownish clathrate species, a few of which are found in nearly every fauna, and of which Pleurotoma gibbosa Reeve may be specified as a typical example, the new name Clathrodrillia Dall may be used." (Dall). Grant and Gale, 1931, p. 579 considered this a subgenus of Clavus distinguishing it as follows: " Shell like that of the typical subgenus but sculptured with axial ribs instead of nodes and with prominent spiral cords overriding the ribs.".

Mr. A.M. Strong comments: " I do not think Clathrodrillia is represented north of San Diego. C. renaudi Arnold does not seem to have been reported by any one as living except by Dall." Rept. S. end San Clemente 40 fms.(Baker)

Clathrodrillia renaudi Arnold,1903. San Pedro, Calif. Also Pleistocene.

Genus Suavodrillia Dall,1918. Type (o.d.): Drillia kennicottii Dall. Recent, Alaska.

" Shell like that of Aforia, with a somewhat angular notch remote from the suture, but with a shorter anterior canal" (Grant & Gale,1931, p.509.

(con.)

Grant and Gale, 1931 p 509 considered this a subgenus of Leucosyrinx. However, the majority of recent writers have been giving it generic standing.

Suavodrillia kennicottii Dall,1871. Bering Strait south to the Aleutian Islands. Type locality: North Harbor, Unga Island.
Suavodrillia willetti Dall,1919. Forrester Island, Alaska.

Genus Ophiodermella Bartsch,1944. Proc. Biol. Soc. Wash., vol.57, p 61-62 Type (o.d.): Ophiodermella ophioderma (Dall)= Pleurotoma ophioderma = Pleurotoma inermis Hinds 1844 not Bartsch 1843.

Dr. Dall placed these species under Clathrodrillia and subgenus Moniliopsis. Other authors such as Grant and Gale,1931 have been using as genus Moniliopsis Conrad,1865 (p. 143). Type (monotypy), Pleurotoma elaborata Conrad. (Claibornian) Middle Eocene, Alabama. Dr. Joshua L. Baily Jr. comments on this: " Moniliopsis Conrad cannot be a subgenus of Clathrodrillia as Dall made it in Bull. 112 because it is the older name. If the two are closely related, Clathrodrillia must be the subgenus."

Mr. A.M. Strong comments as follows: " Ophiodermella is probably a good genus. O. fancherae is figured as a young specimen of O. halcyonis Dall but has priority. O. rhines Dall is a new name for O. cancellata Carpp."

Description of Ophiodermella Bartsch follows:

" Shell rather large, regularly conic, with the first 2 nuclear whorls smooth and well rounded. The succeeding turns gradually develop the postnuclear sculpture. The postnuclear whorls bear axial riblets which assume a sigmoid trend (these vary materially in strength in the different species). In addition to this axial sculpture numerous fine incremental lines are present. The spiral sculpture consists of low cords and fine spiral striations. The base is usually marked with a little more intense sculpture, while on the columella it again becomes decidedly enfeebled. The columella bears a weak basal fasciole. The aperture is moderately long and moderately broad. The posterior sinus is moderately deeply incised, the deepest portion falling a little posterior to the middle of the turns. Anterior canal moderately long. The inner lip is sigmoid. The operculum is quite small, ovate, with apical nucleus and concentric lines of growth. The radula bears marginal teeth only which resemble a long slender curved awl."

" While superficially the species in the new genus resemble Moniliopsis other structures point to a wide separation. Moniliopsis has three smooth nuclear turns followed by axially ribbed stage which in turn is succeeded by the postnuclear sculpture. Also, the columella of Moniliopsis is straight, not sigmoid as in the present genus. These are good and sufficient characters for separation."

Ophiodermella montereyensis Bartsch,1944. Proc. Biol Soc. Wash. vol. 57, p 62 Type locality: Monterey Bay at Sta. 3138, Albatross in 19 fms.

The original description follows: " Shell small, elongate-turrited, reddish horn colored with the inside of the ourter lip a little paler. The nucleus consists os 2 small smooth turns which pass into the postnuclear sculpture. The postnuclear whorls are moderately rounded and marked by sigmoid axial ribs which are not quite as wide as the spaces that separate them, and the spiral threads about as wide as the axial ribs. The combination of these two elements lends to the whorls a somewhat fenestrated appearance. Periphery slightly angulated. Base moderately well rounded and marked like the spire. The columella is rather slender, sigmoid and marked by spiral cords which are more distantly spaced than those on the spire and base. Aperture elongate pear-shaped with the deepest incision of the moderately profound

(con.)

posterior sinus about two thirds of the distance between the summit and the suture, anterior to the summit. Anterior to the posterior sinus the outer lip is protracted. The inner lip is sinuous and bears a shining resorption area on the columella, which also extends over the parietal wall."

" In its type of sculpture the species most nearly resembles *O. halcyonis* but it differs from that in having much more numerous axial riblets and in being smaller."

? *Ophiodermella grippi* (Dall),1919. Malaga Cove (Burch) to San Diego. Type locality: San Diego.

Collecting data: This species probably does not belong in this genus but Dr. Dall had it grouped here. It seems quite different from the other species involved. Grant and Gale comment on it as follows " This species is very interesting because it bridges the gap between *Moniliopsis* and *Pseudomelatoma*. The strength of the spiral sculpture and the more delicate construction of the shell place it here rather than in *Pseudomelatoma*." When we first collected this species from holdfasts of kelp in Santa Monica Bay it was a puzzle for all of us until Dr. A. Myra Keen compared the specimens with the type in Washington, D.C. Mr. and Mrs. E.P. Chace and Mr. and Mrs. Ralph Bormann have collected a number of specimens at White's Point, San Pedro.

This species should not be confused with the species listed in Bull. 112 as *Lora grippi* which is a very different thing.

Other collecting records are Point Vincent (Lowe); Imperial Beach from kelp holdfasts (Randall);

Ophiodermella incisa(Carpenter)1864. Puget Sound to San Pedro, Calif.

Dr. A. Myra Keen advises on this species: " The type locality of *O. incisa* is Neah Bay, according to the holotype label in the USNM. It is sometimes stated to be a homonym, but if so it is a secondary one. The name *effusa* Carpenter is available if ever needed."

Collecting data: De Poe Bay, Oregon; Crescent City, Calif.; dredged off Monterey in 20 fms. shale (Burch); Port Orchard, Wash. (Lowe).

Ophiodermella ophioderma (Dall),1908. Baulinas Bay, Calif. to Ballenas Lagoon, L.C. New name for *Drillia inermis* Hinds. Type Loc.: Magdalena Bay.

Collecting data: Our experience has been to find this a not uncommon littoral species from Monterey to Todos Santos Bay.; dredged in shallow water 10 fms. off Santa Monica, Redondo Beach in 15-25 fms.; off Ensenada in 15 fms.; littoral on sand bars at Anaheim Landing, common; (Burch); San Pedro in 10 fms.; San Diego Bay: Alamitos Bay (Lowe).

Ophiodermella rhines (Dall), 1908. New name for *O. cancellata* Carpenter.

British Columbia to San Diego, Calif. Type locality: Puget Sound.

Collecting data: dredged in Puget Sound off San Juan Islands (T. Kincaid) (Burch); Departure Bay, B.C. in 25 fms.; off San Juan Islands in 25 f. (Lowe).

Ophiodermella fancherae (Dall),1903. (In syn. O. halcyonis (Dall),1908.)

Burrard Inlet south to Point Abreojos, L.C. Type locality: near Avalon, Catalina Island. Type Loc. of halcyonis: off Coronado Beach,San Diego, Calif.

Collecting data: Dredged off Redondo Beach in 25 fms.; off Avalon, Catalina Island in 25 fms.; off Ensenada, Mexico in 25 fms.; (Burch); San Pedro in 8 fms.; Catalina Island in 30 fms. (Lowe).

Genus *Burchia* Bartsch,1944. Nautilus 57:115.

" Shell large, turrited, covered by a strong periostracum. Nuclear whorls small (badly eroded in all our specimens). Postnuclear whorls with a concave sinal area which extends over the posterior third of the turns.

(con.)

The anterior two-thirds are convex and crossed by strong, low, broad, retractively slanting axial ribs which evanesce on the base. The sinal area shows a few incised spiral lines, while the entire rest of the surface bears feeble rather distinctly spaced spiral threads which become intensified on the base of the columella. Suture well impressed. Base moderately rounded. Columella short and stout. The aperture is ovate. The outer lip with a deep posterior V-shaped sinus below the summit; anterior canal rather broad; inner lip reflected over the columella and parietal wall as a heavy calluswhich may be somewhat thickened at the posterior angle of the aperture. Operculum small, oval, with a low ridge on the right side and apical nucleus, marked on the outside by concentric lines of growth. Radula with Y-shaped marginals only."

Type: Burchia redondoensis (Burch). (= *Pseudomelatoma semiinflata redondoensis* Burch).

Burchia redondoensis (Burch),1938. Off Redondo Beach to Newport Bay. Type locality: off Redondo Beach in 25 fms. Nautilus 52:21,22, text f. 2.

The description follows: " Shell brown under a black periostracum. Longitudinal sculpture consisting of 14 low, slightly oblique ribs, weaker than on typical *semiinflata* and evanescing below the periphery of the penultimate whorl. Whorls of spire subangular just anterior to the suture. Spiral sculpture more prominent on the base than on spire and consisting of slightly raised lirae. Dimensions: alt. 45 mm; length of aperture, 18 mm.; diameter of body whorl, 12 mm. "

Genus *Pseudomelatoma* Dall,1918. (p. 317). Type (o.d.): *Pleurotoma penicillata* Carpenter.

" Shell fusiform, spire longer than the aperture, whorls longitudinally ribbed or nodulous, aperture oblong-ovate; sinus shallow, outer lip thin, inner lip with thin coating of enamel; canal short and nearly straight. Differs from *Clathrodrillia* in stronger sculpture and less prominent sinus" (Oldroyd).

Mr. A.M. Strong comments on this genus: " *Pseudomelatoma* ' seems to be a good genus. The species names have been used by different people for different shells and the locality records all depend on the person who identified them. I think *P. torosa* Carp. should be confined to the Monterey area, *P. moesta* Carp. and the worthless variety or color form *aurantia* to southern California and the northern part of Lower California while *P. penicillata* Carpenter is to be found from Cerros Island and south to Cape San Lucas."

Pseudomelatoma moesta (Carpenter),1864. Monterey, Calif. to Cerros Island, L.C. (Dall). Type locality: Santa Barbara, Calif.

It is very doubtful if this species is found in the Monterey area.

Collecting data: San Pedro, Pt. Firmin, White's Pt.; Bird Rock, San Diego; P. los Verdes; Pt. Vicente:Dana Pt., Orange Co.; Punta Banda, L.C.; many shore localities, very abundant at San Onofre (Burch); San Pedro (Lowe).

Pseudomelatoma torosa (Carpenter),1864. Monterey, Calif. south to San Ignacio Lagoon, L.C. (E. Jordan). Type locality: Monterey, and north.

As stated above we think this species is confined to the Monterey area.

Collecting data: Do Poe Bay, Oregon; Crescent City, Calif.; dredged off Monterey in 10-40 fms. (Burch); Monterey and Cayucos (Lowe).

Pseudomelatoma torosa aurantia (Carpenter),1864. Dr. A.M. Keen advises thsat the type locality is San Pedro to San Diego. However, it seems obvious that this is a color form of *moesta* and certainly not of *torosa*. (Burch).

[illegible]

[illegible]

Pleurotoma bottae Valenciennes (in Kiener 1839-40).

" Shell somewhat claviform, tuberculated; scarcely any anterior canal; internal lip with a thick posterior callus; external lip thick within."(Tryon).

Dr. Dall and others have placed our species montereyensis Stearns in this genus. Grant and Gale consider it a subgenus of Clavus.

Bartsch and Rehder described a new subgenus in 1939 which seems to have been rather generally raised to generic standing and our species should be placed in it according to Mr. A.M. Strong. Crassispirella.

Genus Crassispirella Bartsch and Rehder, 1939. (p. 135). Type (o.d.), Turris rugitecta Dall. Recent, Lower Calif. Figd. Dall, 1919 (pl. 7, f. 6) Proc. of USNM, vol. 87, no. 3070, p. 135, 1939.

Crassispirella montereyensis (Stearns), 1871. Monterey, Calif. to Mazatlan.

Genus Pleurotomoides Bronn., 1831. (p. 47). Nom. nov. for Defrancia Millett, 1827, non Defrancia Bronn. 1825. See Iredale 1917, p. 326, and Woodring 1928, p. 187. Type (s.d. Dall, 1908, p. 260): Defrancia pagoda Millett. Miocene, Italy.

Bartsch, 1941, Proc. Biol. Soc. Wash., vol. 54, p. 2 discusses this matter with the above conclusion.

Dr. Dall used Cryptogemma Dall, 1918 (p. 318). Type (o.d.): Gemmula benthina Dall, 1908. Gulf of Panama to Ecuador in 812-1360 fms. Proposed as a subgenus of Gemmula. This is a synonym of Hemipleurotoma according to Grant and Gale.

Dr. A. Myra Keen comments:" According to Bartsch, 1941 (and I think he is right), Pleurotomoides is a substitute for Defrancia and automatically takes the same type."

Grant and Gale figure Hemipleurotoma cossmann, 1899 (pl. 26, f. 36). Type (o.d.): Pleurotoma archimedis Bellardi. (Helvetian) Middle Eocene, Italy.

However, Dr. Bartsch has described a new genus Carinoturris designating one of these species a genotype and describing another species. Dr. Bartsch, however, advises (Per. Comm. May, 1946) regarding the group of species listed by Dall under Cryptogemma " This is a mixture of a number of things which my MS straightens out."

? Pleurotomoides pernodata (Dall), 1908. Tillamook, Oregon to Tehuantepec in deep water. Type locality: Albatross station 3414, southwest of Tehuantepe c in the Pacific in 2,232 fathoms.

? Pleurotomoides calypso (Dall), 1919. Off San Diego, Calif. in 822 fms.

? Pleurotomoides herilda (Dall), 1908. Santa Barbara, Calif. to Panama in deep water. Type locality: Albatross station 3360, Gulf of Panama in 1,672 fathoms.

? Pleurotomoides cymothoe (Dall), 1919. Santa Barbara Islands to San Diego, Calif. in deep water. Type locality: off San Diego, Calif. in 822 f.

? Pleurotomoides polycaste (Dall), 1919. Off Tillamook, Ore. in 786 fms. to Gulf of Calif. Type locality: off Tillamook, Ore. in 786 fms.

Pleurotomoides chrysothemis (Dall), 1919. Between Santa Catalina and San Clemente Islands in 704 fathoms and off North Coronado Island, in 656 fms. Type locality: between Catalina and San Clemente Islands.

Pleurotomoides eidola (Dall), 1919. Off San Diego, Calif. in 312 to 822 fms.

Pleurotomoides oregonensis (Dall), 1919. Off Tillamook, Ore. in 786 fms.

Genus Carinoturris Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p.60. Type (o.d.): Carinoturris adrastia (Dall) = Cryptogemma adrastia Dall.

Carinoturris adrastia (Dall),1908. Monterey to San Diego, Calif. in deep water. Type locality: Monterey Bay in 578 fathoms.
Carinoturris fortis Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 60. Type locality: Albatross Sta. 3187 off Point Sur, Calif. in 298 fathoms.

The original description follows: " Shell large, elongate-conic, covered with a grayish olivaceous periostracum. Nuclear whorls decollated. The postnuclear whorls have a weak median spiral cord. Anterior to this they curve convexly to the slightly shouldered summit. This area is marked by retractively curved incremental lines only. The anterior half of the last whorl and base are inflated, strongly rounded, and marked by strong incremental lines which vary in strength and almost give to the base an obscurely ribbed aspect. Columella rather stout, moderately long, twisted. The left outline of the base and columella is moderately concave. Aperture elongate pear-shaped with the anterior canal moderately long and rather broad. The posterior sinus is broad and extends from the summit to the median cord. Anterior to this the outer lip is protracted. The inner lip is obliquely truncated, free for about two-fifths of its basal length. The posterior portion appears on the columella as a smooth resorption area which also extends over the parietal wall."

" It is easily distinguished from C. adrastia Dall by having a much longer aperture and the spiral keel much less developed."

Genus Rectiplanes Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 59 Type (o.d.): Rectiplanes santarosana (Dall)= Pleurotoma (Antiplanes) santarosana Dall.

Inasmuchas santarosana is a dextral shell I suggested that perhaps Rectiplanes was described to include all of the dextral species grouped under Antiplanes by Dr. Dalland others. However, Dr. Bartsch advises me (Per. Comm. May,1946) " Largely, not all. Some belong to another subfamily." We will therefore simply list the one type species here and place all other species under Antiplanes until further notice.

Rectiplanes santarosana (Dall),1902. Point Sur to San Diego.
Type locality: off Santa Rosa Island in 53 fathoms. Bull. 112,pl.1,f.9

Collecting data: Dredged off Redondo Beach in 75 fathoms mud bottom (Burch); off the south end of San Clemente Island in 40 fms. (Dr. Baker).

Genus Antiplanes Dall,1902 (p. 513). Type (o.d.): Surcula perversa Gabb. Post-Pliocene to Recent, California.

Grant and Gale used the name Spirotropis G.O. Sars,1878.(p. 242). Type (monotypy): S. carinata Philippi. Recent, Norway to Azores. They used Spirotropis for the entire group and placed Antiplanes as one of the subgenera. However, this does not seem to have been generally accepted.

Antiplanes abarbarea Dall,1919. Cape Martin to Cortez Bank, Calif.
Type locality: off Santa Rosa Island in 55 fathoms.
Antiplanes agamedea Dall,1919. Off Cape San Quintin in 359 fathoms.
Antiplanes amphitrite Dall,1919. Off Santa Barbara Island in 638 fathoms.
Antiplanes amphitrite beroe Dall,1919. Off San Diego,Calif. in 822 fathoms.
Antiplanes antigone Dall,1919. Off San Diego, Calif. in 822 fms.
Antiplanes amycus Dall,1919. Monterey Bay, in 581 fathoms.

(con.).

Antiplanes beringi Aurivillius,1885. Bering Sea south of St. Lawrence Island to the Laeutians and eastward to the Shumagin Islands.
Type locality: Dr. A.M. Keen advises " probably Lat. 60 39' N, Long. 177 5'W.
Antiplanes briseis Dall,1919. Drake's Bay to Coronado Islands.
Type locality: off Drake's Bay, Calif. in 30 fathoms.
Antiplanes bulimoides Dall,1919. Bowers Bank, Bering Sea.
Antiplanes catalinae Raymond,1904. Esteros Bay to San Diego.
Type locality: off Catalina Island in 125 fms.
Antiplanes diaulax Dall,1908. Off Coronado Islands.
Antiplanes diomedia Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p 58.
Albatross Sta. 3186 off Point Sur, Calif. in 328 fathoms.

The description follows: " Shell moderately large, turrited, sinistral, covered with a thin olivaceous periostracum. Nuclear whorls eroded. The postnuclear whorls are inflated, strongly inflated rounded, slopingly shouldered, and marked by rather strong sinuous incremental lines which follow the outline of the posterior sinus. In addition to this, they are marked by weak , oblique, dendritic markings. Suture very strongly constricted. Base of the lastwhorl moderately rounded, moderately long. The columella is rather stout, moderately long, somewhat twisted, and marked by the continuation of the incremental lines. Aperture short, very broad and large. Outer lip thin with a broadly incised posterior sinus anterior to which it is protracted. The inner lip is sinuous and reflected over the columella as a thick callus . The anterior canal is short and broad.

This somewhat resembles Antiplanes profundicola but is ever so much larger."

Antiplanes hyperia Dall,1919. Off Drake's Bay and the Coronado Islands.
Type locality: Off Drake's Bay, Calif. in 30 fathoms.
Antiplanes kamchatica Dall,1919. Southwestern Bering Sea in 48 to 100 fms. .
Antiplanes litus Dall,1919. Coast of Washington to Esteros Bay, Calif.
Type locality: off Esteros Bay, Calif. in 92 fathoms.

Collecting data: off Redondo Beach in 75-100 fathoms.

Antiplanes major Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 29,1944.
Type locality: Albatross Sta. 3172, off Bodega Head in 62 fms., lat. 38 23' 35" N, long. 123 14 ' W. on black sand bottom. The description follows:
" Shell very large, elongate-turrited, covered by a reddish olivaceous thin periostracum. Interior of the aperture with a brownish flush which is intensified in a narrow band at the summit and another one at the insertion of the columella. In some specimens the entire aperture is brown. Nuclear whorls 2, small, smooth, forming a slightly expanded tip. The postnuclear whorls are slightly rounded, very narrowly shouldered at the summit and marked by rather strong incremental lines which are decidedly sigmoid and follow the outline of the posterior sinus. The channel and the region posterior to it are marked by inconspicuous, microscopic, spiral threads. In addition to this, fine oblique dendritic threads are present which radiate retractively from the median portion to the posterior sinus. Anterior to the posterior sinus the whorls are marked by strong spiral threads which vary in size and spacing. Base rather long, marked by incremental lines and spiral threads which are stronger than those on the anterior portion of the whorls. Columella rather long marked like the base. Aperture elongate tear-shaped with the anterior channel rather long and broad. The posterior sinus is deep and the outer lip is protracted anterior to it. The inner lip is sinuous and marked as a smooth resorption area."

" This species can readily be distinguished from all other California Antiplanes by its huge size."

Antiplanes perversa Gabb,1865. Forrester Island, Alaska to San Diego and Cortez Bank. Type locality: . Post Pliocene. Catalina Id. 60 fms.

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms. mud; off Avalon, Catalina Island in 50 fms. (Burch); San Diego (Kelsey); Catalina Island in 50 fms.; Santa Barbara channel in 200 fms.; San Diego in 150 fms. (Lowe); Victoria & Strair of Juan de Fuca (Eyerdam).

Antiplanes profundicola Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, pp. 57-58. Range: Off Point Sur Light to North Coronado Island in 656 fathoms. Type locality: Albatross Sta. 4352 off Point Loma Lighthouse, Calif. in 549 to 585 fathoms. The description follows.: " Shell ofm medium size, rather stout in comparison to its height, sinistral, covered with a thin olivaceous periostracum. Nuclear whorls eroded. The postnuclear whorls are inflated, strongly rounded, and marked by decidedly sigmoid incremental lines which follow the outline of the very deeply incised broad posterior sinus. In addition to this, the whorls are marked by slender, retractively curved, dendritic threads which radiate obliquely, retractively from the middle of the turns both anteriorly and posteriorly. The anterior half of the whorls also bears feebly incised spiral threads. Suture very strongly constricted. Base rather short, well rounded. Columella moderately long and stout. The base and columella are both marked by the continuations of the incremental lines and spiral threads, the latter become stronger on the columella. The right outline of the base and columella is decidedly concave. Aperture large. Anterior canal broad and short. Outer lip thin, protracted anterior to the sinus; inner lip decidedly sigmoid, reflected over and appressed to the base and columella." " The short stout form will readily distinguish this species from the other members of the region."

Antiplanes rotula Dall,1921. (smithi) Forrester Island, Alaska to San Diego, Calif. Type locality: San Pedro Pleistocene. Bull. 112

Collecting data: Dredged off Redondo Beach in 50 fathoms (Burch); off Catalina Island in 35 fms. (Lowe).

Antiplanes thalaea Dall, 1902. Unimak Pass, Aleutian Islands to San Diego, Calif. Type locality: off San Luis Obispo, Calif. in 252 fms.

Collecting data: Off Redondo Beach in 50 fms. (Burch); off Point Loma in 40 fms. (Kelsey and Baker); off Redondo Beach in 35 fms. (Tremper).

Dr. A. Myra Keen advises: " The figures of A. thalaea and santarosana were interchanged in Bull. 112 and copied by Mrs. Oldroyd. Correct references are: Bull. 112, pl. 1, fig.8; Oldroyd, vol. 2, pt. 1,, pl. 6, fig.1, for thalaea."

Antiplanes vinosa Dall,1874. Bering Sea to San Diego, Calif. Type locality: Kyska Harbor, Great Kyska Island, Alaska.

Genus Borsonella Dall, 1908 (p. 258). Type (o.d.): Borsomia dalli Arnold. Grant and Gale consider this a subgenus of Spirotropis. This has not been generally accepted.

Borsonella angelana Hanna,1924. New name for B. dalli Arnold,1903. Drake's Bay, Calif. to Coronado Islands. Type locality: Pleistocene of San Pedro, Deadman's Island.

Borsonella barbarensis Dall,1919. Off Santa Barbara Islands in 414 fathoms.

Borsonella bartschi Arnold,1903. Rodondo Beach (Burch) to San Diego. Type locality: Lower San Pedro, Deadman's Island fossil.

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms. (Burch).

Borsonella civitella Dall,1919. Off Point Loma, Calif. in deep water.

Borsonella coronadoi Dall,1908. San Clemente Island, Calif. to the Coronado Islands. Type locality: off Los Coronado Islands.

[illegible] Galapagos Islands in deepwater. Type Loc.: off San Diego in [illegible] fms.
Borsonella nicoli Dall,1919. Off Point Loma, Calif. in deep water.
Borsonella omphale Dall,1919. Off Point Loma, Calif. in deepwater.
Borsonella pinosensis Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p.63. Off Point Pinos Lighthouse in 49-50 fathoms. The description follows:
" Shell rather large, elongate-turrited, covered with a pale olivaceous periostracum. Nuclear whorls decollated in all our specimens. The post-nuclear whorls are moderately well rounded, appressed at the summit with the posterior sinal area slightly impressed, extending from the summit to about two thirds of the distance between the summit and the periphery. The whorls are marked by irregularly developed, closely spaced incremental lines which assume almost the strength of riblets. In addition to this, feeble incised spiral lines are present which are best developed on the posterior half of the turns. There are also certain criss cross markings present. But well rounded and marked like the spire. Columella stout with a narrow umbilical chink at the posterior portion. The columella is marked by a continuation of the axial sculpture. Aperture elongate pear-shaped. The posterior sinus falls immediately below the summit and s broad and moderately deep. Anterior to the posterior sinus the outer lip is protracted into a claw-like element. The inner lip is thick and reflected over the columella and bears an obscure fold a little anterior to its insertion. The parietal wall is covered by a moderately thick callus.

This species seems to have been confused with Borsonella dalli Arnold from the Pleistocene of Deadman's Island, but the strong angulation of the whorls of dalli will readily distinguish it from the present species."
Borsonella nychia Dall,1919. Off Point Loma, Calif. in 101 fathoms.

Genus Rhodopetoma Bartsch, 1944. Proc. Biol. Soc. Wash., vol. 57, p. 59. Type (o.d.): Rhodopetoma rhodope (Dall) =Borsonella rhodope Dall.

Rhodopetoma rhodope Dall,1919. Off Santa Rosa Island in 82 fathoms and off San Diego in 633 fathoms. Type locality: off Santa Rosa Island.

Genus Lora Gistel,1848. (p.9). The status of this name is without a doubt so questionable as to assure its abandonment at least for our shells. Dr. Paul Bartsch, " The Nomenclatorial Status of Certain Northern Turritid Mollusks", Proc. Biol. Soc. Wash., vol. 54, pp. 1-14, Feb. 26,1941 gives us a discussion of the matter with the description of a number of new genera. In this paper we propose to allocate such species that have been mentioned to Dr. Bartsch's new genera or elsewhere as advised, and then simply list our collecting records for the remaining species under the name Lora with " Lora" indicating that it is understood that sooner or later the species will be placed elsewhere.

Grant and Gale attempted to make a case for Lora with type D. viridula Fabricius, but this has been generally rejected.

Dr. Joahua L. Baily Jr. comments: " Lora Gistel. This name I would abandon altogether in accordance with the decision of the A.M.U. Committee on Nomenclature.".

Mr. A.M. Strong comments: " I do not think that Bela, Lora or Mangelia can be used for any of our shells. Except where Bartsch has designated a genus, I think that the only thing we can do is to list the various species as " Mangilia" showing that we do not list them in any definite genus."

(con.).

Dr. A. Myra Keen comments: " Bartsch's 1941 paper cited above is our only modern clue to the nomenclature of " Lora" and its allies. Bartsch names a number of new genera and hints that other names are forthcoming. However, he lists several generic names and cites types that will cover at least a part of our species. I have taken the time to allocate only a few. Here they are, with locality ranges from our collections: "

Dr. L.G. Hertlein of the California Academy of Sciences has kindly sent us a list of the locality records of this group in their collection.

Genus Propebela Iredale,1918. (p. 32). Type (o.d.): Murex turricula Montagu. Recent, British Isles and Northern Europe. Figd. Forbes and Hanley 1851 (Pl. 111, figs. 7,8.).

Propebela nazanensis (Dall), 1919. Nazan Bay, Atka Island to Kodiak Island, Alaska. Type locality: Nazan Bay.

Collecting data: Kodiak Island (Stanford Coll.); Elrington Island, Pr. Wm. Sound, Alaska, 1924 (Eyerdam); Portage Bay, Alaska, midway between Cape Igvak and Unalashigvak, in 17 fms. (G.D. Hanna and E.W. Scott- Calif Acad. of Sci.);

Propebela nobilis (Muller), Arctic Ocean, Bering Sea, off Akutan Pass, in 60 fms. to Port Vita, Raspberry Island, Alaska in 10-20 fms.,1945(Eyerdam) . Type locality: off Akutan Pass.

Propebela turricula (Montagu),1803. Icy Cape, Arctic Ocean to Puget Sound, Bristol Channel, western and eastern parts of England and Wales, on all the Irish, Scotch and Icelandic coasts. Type Loc.: Sandwich, Kent.

Collecting data: Puget Sound (Stanford Coll.); Izhut Bay, Afognak I., and Sawmill Bay, Pr. Wm. Sound, Alaska (Eyerdam); Portage Bay, Alaska, midway between Cape Igvak and Unalashigvak, in 17 fms. (G.D. Hanna and E.W. Scott- Calif. Acad. Sci.).

Subgenus Turritoma Bartsch,1941. Proc. Biol. Soc. Wash., vol. 54, p.7. Type(o.d.): Propebela (Turritoma) exquisita Bartsch,1941. Recent, Japan.

Propebela diomedia Bartsch,1944. Proc. Biol. Soc. Wash., vol. 57, p.66. Type locality: Monterey Bay, Albatross Sta. 3670 in 581 fms.
The description follows: " Shell small, thin, yellowish white. Nuclear whorls decollated. The postnuclear whorls are strongly rounded with a decided angulation at the anterior limit of the posterior sinus. The postnuclear whorls are marked by strong, protractively slanting axial ribs which are about half as wide as the spaces that separate them. Of these ribs, 18 are present on the last turn and 15 on the preceding whorl. The spiral sculpture consists of fine incised lines on the shoulder of the turns, that is the sinal area. The shoulder is marked by a spiral cord that renders the axial ribs very strongly nodulose. Anterior to the shoulder the whorls are marked by strong spiral cords of which 2 are present on the first remaining turn, 3 on the second and 4 on the third and last turn. Base strongly rounded and marked by the feeble continuations of the axial ribs and 8 spiral threads which become slightly weaker toward the columella. The columella is slender, slightly concave on the left side, and marked by 17 spiral threads. The aperture is pear shaped. The posterior sinus is moderately deep. Anterior to the posterior sinus the outer lip is protracted and slightly concave on the basal portion. The inner lip is appressed to the columella which it marks as a slight absorption area that extends over the parietal wall. It differs from P. (T.) monterealis Dall in being much shorter, stouter with more angul-

(con.)

-ated shoulder and in having more distantly spaced ribs."

Propebela monterealis Dall,1919. Monterey Bay, Calif. in 581 fathoms.

Propebela profundicola Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 67. The description follows: " Shell moderately large, elongate-ovate, yellowish white. Nuclear whorls decollated. The postnuclear whorls are well rounded r ed and bear a moderately strong angulation at the anterior termination of the posterior sinal area. The last postnuclear whorl bears 14 broad heavy axial ribs which are not quite as wide as the spaces that separate them. The preceding turn has 11 ribs. The spiral sculpture consists of 6 slender spiral threads in the sinal area, while the angulation a heavier cord is present which renders the axial ribs nodulose. The space between the angulation and the suture bears 5 low spiral cords between which finer spiral threads are present. The base is moderately long, well rounded, and marked by the continuation of the axial ribs and 15 spiral threads, between which and on which finer spiral striations are present. The columella is moderately long and marked by feeble spiral threads. Aperture pear-shaped. The posterior sinus extends fromthe summit to the angulation and is shallow. Anterior to the posterior sinus the outer lip is protracted. The inner lip is reflected over the columella as a smooth area which extends over the parietal wall.

This species is much larger than Propebela (Turritoma) diomedea, with the axial ribs coarser, heavier and even more distantly spaced, while the nodulation of the shoulders of the whorls is much less strong."

" The ttpe, U.S.N.M. No. 274112, was dredged by the U.S. Bureau of Fisheries steamer Albatross at station 4538 in 871 fms. on gray sand and rock bottom, off Point Pinos Light. It has 4 whorls remaining and measures Height, 13.3 mm.; greater diameter, 6.2 mm."

Propebela (Turritoma) smithi Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57, p. 67. Type locality: Albatross Sta. 4508 in 293-386 fms. off Point Pinos Light, on mud bottom. Type has 5 whorls and measures: Height, 9.5 mm; greater diameter, 4.3 mm. The description follows: " Shell moderately large, elongate-ovate, thin, yellowish white. Nuclear whorls decollated. The postnuclear whorls are well rounded. They are slightly channeled at the summit and roundly shouldered at the angulation, which is two-fifths of the distance between the summit and the suture, anterior to the summit. They are marked by slender, somewhat sinuous, protractively slanting, axial riblets which are best developed on the middle turns. On the last 1.5 turns they become gradually reduced and on the last portion of the last turn for m mere incremental lines. The rounded shoulder forming the sinal area bears 6 slender spiral threads. Anterior to this, the whorls are marked by 9 stronger spiral cords which are separated by spaces about as wide as the spiral cords. On the last turn the spiral sculpture also becomes much reduced; 16 threads are here indicated. Base well rounded and marked by incremental lines and spiral threads a trifl stronger than those on the spire. Columella moderately stout, slightly concave on the left side, and marked by spiral threads of about the same strength as those on the base on its posterior half. On the anterior half the spiral markings become very fine. Aperture ovate. Posterior sinus immediately below the summit, moderately deep and rounded. Anterior to the posterior sinus the outer lip is protracted. The inner lip is reflected over the cokumella as a thin callus which extends up on the parietal wall." " The fine axial ribs and fine spiral sculpture of the last 1.5 whorls will readily distinguish this species from the other here described ."

Genus Granotoma Bartsch,1941. Proc. Biol. Soc. Wash., vol. 54, p. 5 Type (o.d.): Granotoma krausei (Dall)- Bela krausei Dall (fig.9).

Granotoma krausei (Dall),1886. Port Etches, Alaska (Dall) and Shuyak Strait, Afognak Island, Alaska,1924 (Eyerdam). Type Loc.: Port Etches

Granotoma excurvata (Carpenter),1865. Bristol Bay, Bering Sea to Puget Sound. Type locality: Puget Sound.

Collecting data: Akutan Island, Aleutians (I. Norberg) (Eyerdam); Port Vita (Eyerdam); British Columbia (Stanford Collection); off San Juan Islands, Puget Sound (T. Kincaid).

Genus Nodotoma Bartsch,1941. Proc. Biol. Soc. Wash., vol. 54, p. 5 Type (o.d.): Nodotoma impressa (Beck) Morch (fig.2).

Nodotoma impressa (Beck) (Morch),1869. Seahorse Islands, Arctic Ocean to Kodiak Island, Alaska. Circumboreal. Type Loc.: Bellsound (Kroyer).

Collecting data: Isfjord, Coles Bay, Norway,1869 (Soot-Ryen)(Eyerdam).

Genus Oenopota Moerch,1852. Type (s.d. Dall,1919, p.40): Pleurotoma pleurotomaria Couthouy. Bela pyramidalis Strom. considered a synonym of pleurotomiaria Couthouy by Grant and Gale,1931, fgd. Tryon 1884 (Pl. 28, f.40). ? Subfamily . Recent, Massachusetts Bay. Recommeneded as substit-ute for " Bela" auct. by Iredale,1915, p. 229. Equals Lora auct. non Gistel.

The above data from Powell (Ref. Abve.). Dr. Bartsch in his 1941 paper redescribes the genus, pp4,5.

Oenopota pleurotomaria (Couthouy),1838. Nunivak Island, Bering Sea to Puget Sound. Also Atlantic. Type Loc.: Mass. Bay in deep water.

Collecting data: Drier Bay, Knight Island, Alaska,1923 (Eyerdam); British Columbia (Stanford Coll.); Tromsofjord, Norway,1935 (I. Norberg) (Eyerdam);

Oenopota alaskensis (Dall),1871. Bering Sea to Puget Sound. Type locality: Unga Island of the Shumagin Group in the North Harbor in 4 fms.

Collecting data: Izhut Bay, Afognak Id.,and Drier Bay, Knight Id., Alaska (Eyerdam); British Columbia to Puget Sound (Stanford Coll.); Kanat-ak Lagoon, Portage Bay, Alaska in 3 fms. (G.D. Hanna, Calif. Acad. Sci.).

Oenopota rosea (M. Sars), 1846. Simeonoff Island, Shumagins to San Juan Islands, Puget Sound. Type locality: Arctic ?

Collecting data: Izhut Bay, Afognak Island, Alaska (Eyerdam); Queen Charlotte Islands (Stanford Coll.); Portage Bay, Alaska midway between Cape Igvak and Unalashigvak, in 17 fms. (G.D. Hanna, Calif. Acad. Sci.); off San Juan Islands, Wash. (T. Kincaid).

Genus Bellaspira Conrad,1868 (p. 133). Type (monotypy): Mangelia virginiana Conrad. (Yorktown) Upper Miocene, Virginia.

This genus was discussed and figured by Bartsch and Rehder,1938, Proc. U.S.N.M., vol. 87, pp. 133,134. There has been considerable discussion about the generic allocation of our southern California species grippii Dall. It was listed in Bull. 112 as Lora grippii, but it has been the almost unanimous opinion of students that this species certainly does not belong here. It has been placed in Bellaspira by a number of recent authors. We place it here tentatively.

Bellaspira grippii (Dall),1908. Redondo Beach in 25 fms. (Burch), Catalina

(con.)

[illegible]

Collecting data: San Diego (Stanford Coll.); off Malaga Cove in 15 fms.; off Redondo Beach 15-25 fms.; off Avalon, Catalina Island in 25 fms.(Burch).

The following species will be listed as " Lora".

" Lora" albrechti Krause,1885. Plover Bay, Bering Strait to Port Etches, Alaska. Type locality: Plover Bay.

Collecting data: Kodiak, Alaska in 6 to 10 fms. (G.D. Hanna & R.L. Tallant, Calif. Acad. Sci.); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak, in 17 fms. (G.D. Hanna & E.W. Scott, C.A.S.).

" Lora" alitakensis Dall,1919. Unimak Island, Aleutians, to Alitak Bay, Kodiak Island, Alaska. Type locality : Unimak Island.

Collecting data: Shuyak Strait, Afognak Island,1924 (Eyerdam);

" Lora" althorpensis Dall,1919. Shuyak Strait, Afognak Island, Alaska 1924 (Eyerdam) to Granite Cove,Port Althorp, Alaska. Type Loc.:Port Althorp.

Collecting data; off Lees Cabin at mouth of Des Moines Creek, Wide Bay, Alaska in 6-13 fms. (G.D. Hanna, R.L. Tallant & C.E. Leach, C.A.S. Coll.).

" Lora" amiata Dall,1919. Belkoffski, Alaska.

" Lora" arctica A. Adams, 1855. Shumagin Islands to Chirikoff Id.,Alaska. Type locality: Arctic Seas. Coll. Data: Chirikoff Id. (Stanford Coll.)

" Lora" babylonia Dall,1919. Off Tillamook, Oregon, in 786 fathoms.

" Lora" bechtii Moller,1842. Bernard Harbor, Arctic Coast to Drier Bay, Knight Island, Alaska (Eyerdam). Type Loc.: Arctic

Collecting data: Tromso, Norway,(I. Norberg) (Eyerdam).

" Lora" bicarinata Couthouy,1838. Point Belcher, Arctic Ocean to Puget Sound. Circumboreal. Type Loc.: east of Nahant, from stomachof haddock.

" Lora" casentina Dall,1919. Off Pt. Pinos, Calif. in 871 fms.

" Lora" chiachiana Dall,1919. Arctic Ocean to Chiachi Islands and Port Althorp, Alaska. Type Locality: Chiachi Islands, Aleutians.

Collecting data: Drier Bay, Knight Id., Alaska,1923 (Eyerdam).

" Lora" colpoica Dall,1919 (colpoica) Tillamook, Ore. in 786 fms.

" Lora" diegensis Dall,1919. Off La Jolla, Calif. to Cape San Quentin,L.C. Type locality: off San Diego.

" Lora" elegans Moller,1842. Blizhni Islands to St. Lawrence Island, Bering Sea. Type locality not known.

Collecting data: Hammero, Norway (Dr. Soot-Ryen) (Eyerdam).

" Lora" exarata Moller,1842. Arctic Ocean to Monterey, Calif. in 581 fms. Circumboreal. Type Locality : Greenland.

Collecting data: Tromso, Norway (Dr . Soot-Ryen) (Eyerdam).

Mr. Eyerdam also lists a subspecies mitrula from Tromso, Norway.

" Lora" exserta Aurivillius,1885. Listed as subspecies of bicarinata in some lists. Arctic Ocean, north of Bering Strait.

" Lora" fidicula Gould,1849. Aleutian Islands to Puget Sound. Type locality: Puget Sound. Collecting data: British Columbia to Puget Sound (Stanford Coll.); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak, in 17 fms. (G.D. Hanna & E.W. Scott, Calif. Acad. Sci.); Izhut Bay, Afognak Id.,1922 and Drier Bay, Knight Id., 1923,Alaska (Eyerdam); off San Juan Islands, Puget Sound (T. Kincaid) (Burch).

" Lora" fiora Dall,1919. Adakh Island, Aleutians to Sitka, Alaska. Type locality: Adakh Island.

" Lora" galgana Dall,1919. Unalaska, Aleutian Islands in 351 fathoms.

" Lora" harpa Dall,1884. Arctic Ocean, Queen Charlotte Ids., Circumboreal. Type locality: Nunivak Island, Alaska. Coll. Data: Izhut Bay, Afognak Id. Alaska (Eyerdam).

"Lora" harpularia Couthouy, 1838. Point Belcher, Arctic Ocean,to Puget Sound. Circumboreal. Type locality: from a cod taken off Phillips Pt., Lynn, Mass. Drier Bay, Knight Id.(Eyerdam); Tromsosund,Norway (I. Norberg).

"Lora" healyi Dall,1919. Arctic Ocean north of Bering Sea.

"Lora" incisula Verrill,1882. St. Lawbence Bay, Bering Strait. Atlantic. Type locality: Labrador.

"Lora" inequita Dall,1919. Plover Bay to Vancouver Island, B.C. (Eyerdam). Type locality: Plover Bay, Bering Sea. Coll. Data: Unalaska I. (Eyerdam).

"Lora" kyskana Dall,1919. Kyska Island, Alaska to Puget Sound Type locality: Kyska Island. Collecting data: Illiulliuk Bay, Unalaska, Aleutian Islands, 1932 (Eyerdam); Kodiak, Alaska in 6 to 10 fms. (G.D. Hanna & R.L. Tallant, C.A.S. Coll.); off Kanatak, Portage Bay, Alaska in 6 fms. (G.D. Hanna, C.A.S. Coll.); off Lees Cabin at mouth of Des Moines Creek, Wide Bay, Alaska, in 6-13 fms. (G.D. Hanna, R.L. Tallant & C.E. Leach- C.A.S. Coll.); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak, in 17 fms. (G.D. Hanna & E.W. Scott- C.A.S. Coll.).

"Lora" laevigata Dall,1871. Kotzebue and Norton Sounds to Chirikoff Id., Alaska. Type locality: Norton Sound, Alaska.

"Lora" lawrenceana Dall,1919. Point Belcher, Arctic Ocean to Pribilof Islands, Bering Sea. Type Loc.: Plover Bay.

"Lora" lotta Dall,1919. Queen Charlotte Islands, B.C. to San Diego. Type Loc.: Queen Charlotte Islands.

"Lora" lutkeni Dall,1919. Port Etches, Alaska.

"Lora" lutkeana Krause,1885. St. Lawrence Bay, Bering Strait.

"Lora" maurellei Dall and Bartsch,1910. Barkley Sound, Vancouver Id., B.C.

"Lora" metschigmensis Krause,1885. Metchigme Bay,Bering Strait.

"Lora" miona Dall,1919. Unalaska, Aleutian Islands,1932 (Eyerdam) to Point Reyes, Calif. Type Loc.: Boca de Quadra, Alaska.

"Lora" mitrata Dall,1919. Bering Strait to Shumagin Islands. Type Locality: Port Clarence, Bering Strait.

"Lora" morchi Leche,1878. Blizhni Islands to St. Lawrence Island, Bering Sea and Drier Bay, Knight Id., Alaska (Eyerdam). Evanskjaer,Norway(Soot-Ryen); Tromsosund, Norway (I. Norberg) (Eyerdam).

"Lora" murdochiana Dall,1919. Point Barrow, Arctic Ocean to Pribiloff Islands, Bering Sea. Type Loc.: Cape Smythe, Arctic.

"Lora" nodulosa Krause,1886. St. Lawrence Bay, Bering Strait to Aleutian and Cook's Inlet. Type Loc.: St. Lawrence Bay.

"Lora" pavlova Dall,1919. Off Pribiloff Islands, Bering Sea in 987 fms.

"Lora" pitysa Dall,1919. Off Pt. Pinos to San Diego, Calif. Type L: San D.

"Lora" popovia Dall,1919. Bristol Bay, Bering Sea to Point Pinos, Calif. Type locality: Bristol Bay. Coll. Data: Off Lee's Cabin at mouth of Des Moines Creek, Wide Bay, Alaska in 6-13 fms. (G.D. Hanna,R.L. Tallant, & C.E. Leach- C.A.S. Coll.); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak in 17 fms. (G.D. Hanna & E.W. Scott- C.A.S. Coll.).

"Lora" pyramidalis Strom.,1788. It is likely that this species will be incorrectly placed. Grant and Gale were disposed to place both pleurotomaria (which we placed in Oenopota and haliotropa Dall in the synonymy of this species. Collecting data: Akutan, Aleutian Islands,1931 (Eyerdam); Tromso, Norway (I. Norberg) (Eyerdam); Portage Bay, Alaska, midway between Capes Igvak and Unalashigvak, in 17 fms. (G.D. Hanna & E.W. Scott- C.A.S.). off Friday Harbor, Wash. (T. Kincaid).

"Lora" priblova Dall,1919. Cape Lisburne, Arctic Ocean to Esteros Bay, Calif. Type Loc.: Cape Lisburne. Coll. Data: San Juan Ids.(Kincaid); Chicagof Id. (Norberg); Izut Bay, Afognak Id. (Eyerdam);British C.(Stanford)

" Lora" quadra Dall,1919. Unalaska,Aleutian Islands to Puget Sound. Type locality: Unalaska. Collecting data: off Friday Harbor, Wash. (Kincaid) Drier Bay, Knight Id. and Evans Id., Pr. Wm. Snd., Alaska (Eyerdam); Akutan Id., Aleutians,1931 (I. Norberg) (Eyerdam); Kodiak to British Columbia (Stanford Coll.); Kodiak, Alaska in 6 to 10 fms. (G.D. Hanna & R.L. Tallant- C.A.S. Coll.).

" Lora" rassina Dall,1919. Off Bristol Bay, Bering Sea.

" Lora" regulus Dall,1919. Off Point Reyes, Calif. in 61 fms.

" Lora" rugulata Friele,1886. Unalaska Island (Eyerdam) and Akutan Id. (I. Norberg). Tromsosund, Norway (Dr. Soot-Ryen).

" Lora" rugulata spitzbergensis Friele,1886. Plover Bay to Port Althorp, Alaska. Type locality: Magdalene Bay (Spitzbergen-Svarlbard),40-50 fms.

Collecting data: Unalaska, Aleutian Islands (Eyerdam).

" Lora" reticulata Brown,1827. See Grant and Gale, p. 522. Ill. Rec. Conch. Gt. Brit & Ire. Ed. 1, pl.48,figs. 29,30. Circumboreal. In the Atlantic south to Great Britain and Massachusetts, in the Pacific to San Diego. Type locality: Greenock, Scotland. Grant and Gale place a number of species in the synonymy.

Collecting data: Off Friday Harbor, Wash. (T. Kincaid- Iden. G. Willett); Akutan Island, Aleutians (Eyerdam); off Lees Cabin at mouth of Des Moines Creek, Wide Bay, Alaska in 6-13 fms. (G.D. Hanna,R.L. Tallant & C.E. Leach- CAS Coll.); Kanatak Lagoon, Portage Bay, Alaska in 3 fms. (G.D. Hanna- CAS); Portage Bay, Alaska, midway between Capes Igvakand Unalashigvak in 17 fms. (G.D. Hanna & E.W. Scott- CAS Coll.).

" Lora" scalaris Moller,1842. Bering Sea to Sitka, Alaska. Circumboreal. Type locality: Greenland. Collecting data: Izhut Bay, Afognak Id.,Alaska (Eyerdam); Kodiak, Alaska (Stanford Coll.).

" Lora" simplex Middendorff,1849. Point Barrow, Arctic Ocean to Pribilof Islands and the Okhotsk Sea. Type locality: Okhotsk Sea.

" Lora" sixta Dall,1919. Off San Diego, Calif. in 640 fms.

" Lora" solida Dall,1886. Bering Sea to Puget Sound. Type locality:Harbor of Kyska, Alaska. Collecting data: Izhut Bay, Afognak Island,1922; Drier Bay,1923; Unalaska 1932 (Eyerdam); British Columbia (Stanford Coll.); Kodiak, Alaska in 6-10 fms. (G.D. Hanna & R.L. Tallant- CAS); off Kanatak Portage Bay, Alaska in 6 fms. (G.D. Hanna- CAS); Portage Bay, Alaska midway between Igvak and Unalashigvak in 17 fms. (G.D. Hanna & E.W. Scott- CAS).

" Lora" surana Dall,1919. Off Pt. Sur and Pt. Pinos, Calif. Type loc.:off Pt. Sur.

" Lora" tabulata Carpenter,1865. Sitka, Alaska to Monterey, Calif. Type locality: Neah Bay, Wash. Collecting data: British Columbia to Puget Sound (Stanford Coll.); off Friday Harbor, Wash. (T. Kincaid)

" Lora" tenuicostata M. Sars,1868. St. Lawrence and Nunivak Islands,Bering Sea to Safly Cove, Alaska. Also Atlantic. Type locality: Vadso.

" Lora" tenuilirata Dall,1871. Point Barrow, Arctic Ocean to Shumagin Islands, Alaska. Type locality: Norton Sound, Alaska. Arctic(Stanford)

" Lora" tenuilirata cymata Dall,1919. Nunivak Island, Bering Sea to Shumagin Islands. Type Loc.: Nunivak Id. Alaska (Stanford Coll.).

" Lora" tenuissima Dall,1919. Chernoffski Harbor,Unalaska Id. in 109 fms.

" Lora" trevelliana Turton,1834. Arctic Ocean southward to Behn Canal, Alaska. Circumboreal. Type locality: Scarborough. Tromso,Norway(Norberg).

" Lora"violacea Mighels and Adams,1842. Sea Horse Islands, Arctic Ocean, to Bering Sea to Sitka, Alaska. Circumboreal. Type locality: Casco Bay,Maine.

Collecting data: Hammero,Norway (Dr. Soot-Ryen); Treurenburg Bay, Spitzbergen, 3-14 fms. sand,1861 (Eyerdam)

" Lora" woodiana Moller,1848. White Island, Arctic Ocean to north of Bering Sea. Type locality: Arctic.

" Lora" sp. cf. kyskana Dall,1918. We dredged a species off Redondo Beach, Calif. in 75 to 125 fms. that was identified by Mr. George Willett as " Lora" kyskana. Mr. Willett had a great deal of experience with this northern group but we hesitate to extend a range all the way to southern California without further study.

Genus Pleurotomella Verrill,1873.(p. 15). Type (monotypy): P. packardi Verril. Recent, N.E. coast of U.S.A.

Pleurotomella thalassica Dall,1919. Offf Tillamook, Ore. in 786 fathoms.
Pleurotomella herminea Dall,1919. Off Catalina Island, Calif. in 334 to 600 fathoms.

Genus Clathurella Carpenter,1857 (p. 399). Inasmuchas so many of our members have followed Grant and Gale in the use of this name it seems that we should discuss it here. My limited study of the matter seems to leave me disposed to think that we have more trouble on our hands with the use of the name Clathurella than we would have by simply retaining our old names until Dr. Bartsch or someone convinces us that we should use another. The data below is copied from Powell (Ref. above):
Clathurella Carpenter,1857. Nom. nov. for Defrancia Millet,1827 , non Bronn, 1825.Type (s.d. Dall,1908, p. 260): Defrancia pagoda Millet,1827. (Helvetian) Miocene,Turin, Italy. See Pleurotomoides Bronn,1831.
Grant and Gale (1931, p. 604) and Pilsbry and Lowe (1932, p.55) endeavored to preserve Clathurella on the basis of Cossmann's designation(1896 p. 121) of the Recent Clavatula rava Hinds. As Defrancia was proposed with out a designated type, then Clathurella, published as a substitute name for Millet's Defrancia, must take its type from among the five original species mentioned by Millet,notwithstanding the fact that Carpenter included other species in proposing his substitute name. As Carpenter did not designate a type then his nom. nov. has to be treated strictly as such. Cossmann's designation is invalid because rava was one of Carpenter's inclusions, not in Millet's list."

Mr. A.M. Strong comments on these species as follows: " In the species with the flaring or varicose outer lip no one seems to make any distinction between those with a dentate lip and those with a smooth lip. Philbertia does not seem to be a valid name, at least on the coast. I am using two genera, Clathurella and Glyphostoma, the first with the stubby shell and a short canal and the second with a slender shell and a long canal. In Clathurella I am placing C. affinis, C. conradiana, C. canfieldi and C. crystallina. I think the record of C. rava from San Diego must be a mistake. In Glyphostoma I am placing G. adrana, G. adria and G. cymodoce."
However, whether these names can be retained as Dall used them or not I do not know, but until the dispute is more or less settled perhaps we had as well use the names we now have on our specimens.

Genus Glyphostoma Gabb,1872 (p. 271). Type (monotypy): G. dentiforum Gabb. Miocene, Domican Republic.

(con.)

Glyphostoma conradiana Gabb,1869. Off Redondo Beach, Calif. in 25-50 fms. (Burch) and San Pedro, Calif. Also Pleistocene. Type locality: Post-Pliocene of Santa Barbara.

Collecting data: San Pedro; Redondo in 20 fms. (Lowe); also fossil from Timm's Point, Hilltop Quarry and other deposits. (Burch);Portuguese Bnd.

Glyphostoma adria Dall,1919. San Pedro, Calif. to Acapulco, Mexico (Lowe).

Dr. A. Myra Keen advises on this species " The description in Oldroyd is of another species. The type locality is Santa Maria Bay, Lower Calif. "

This is a little odd because Oldroyd did give the correct reference: Proc. USNM, 56:52; pl.17,fig.5. The original description follows:

" Shell small, slender, acute, pale brownish, or with still paler nebulosity; with three darker brown nuclear whorls, the first minute, the others regularly increasing with a deep suture; subsequent whorls seven, the first peripherally keeled, the periphery rather anterior; subsequent whorls with a broad spirally striated anal fasciole followed by 2 or 3 spiral cords strongest wh re they cross the ribs and feebler in the interspaces; on the last whorl the cords are less prominent, with about equal spirally striated interspaces, and the cords continue becoming more close settoward and upon the canal to the number of 15 or more; axial sculpture of (on the last whorl 10, excluding the terminal varix) protractively oblique ribs extending from in from of the anal fasciole stronger on the periphery and obsolete on the base of the whorl; terminal varix strong, the margin incurved smooth; the anal fasciole large, rounded; the lips callous with minute denticulations; the canal short, deep, recurved,the aperture rather narrow. Height of shell,10; of last whorl,6; diameter 4 mm. "

Collecting data: Acapulco, Mexico in 20 fms.; Punta Penasco, Sonora in 10 fms.; Guaymas,Mex. in 20 fms.; Santa Maria Bay in 15 fms.; Concepcion Bay in 20 fms. (Lowe).

Glyphostoma cymodoce Dall,1919. Monterey to Redondo Beach, Calif. (Burch). Type locality: Santa Barbara, Calif.

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms. mud bottom (Burch); Cayucos (Lowe) (San Diego Museum).

Genus Philbertia Monterosato,1884 (p.132). Type (tautonomy): Pleurotoma philberti Michaud. Recent, Mediterranean (in synonymy of Pleurotoma bicolor Risso).

Philbertia affinis Dall,1871. San Luis Obispo (Oldroyd) to Tres Marias Islands, Mexico (Strong and Hanna). Type locality: Cape San Lucas, L.C.

Collecting data: Bird Rock, San Diego Co. and Punta Banda, L.C.,Mex. both littoral (Burch);

Philbertia canfieldi Dall,1871. Crescent City, Calif. to San Diego (Kelsey). Type locality: Monterey, Calif. Coll. Data: Cayucos, San Luis Obispo C. (Burch).

Philbertia capaniola Dall,1919. Off San Diego, Calif.

Philbertia castianira Dall,1919. Off Cape San Martin, Calif.

Philbertia crystallina Gabb,1865. Off Catalina Island and off Redondo Beach in 50-100 fms. (Burch). Type locality: off Catalina in 50 fms.

Off Catalina in 35 fms. (Lowe) (San Diego Museum). Fossil in San Pedro Pleistocene (Burch); Whites Landing; off Catalina (Strong).

Philbertia hesione Dall,1919. Point Pinos to Point Loma, Calif. Type locality: off Santa Rosa Island, Calif.

Philbertia louisa Dall,1919. Off San Luis Obispo, Calif.

Philbertia rava Hinds, 1843. Laguna Beach, Calif. to Gulf of Calif. (Dall) Type Loc.: Gulf of Nicoya,Central Amer. Mr. Strong thinks Calif. records error.

Genus Mangelia Risso,1826. Type (s.d. Hermannsen 1852, p. 80): Mangelia striolata Risso = Pleurotoma villiersii Michaud = Murex attenuatus Montagu.

Woodring, Wendell P. " Miocene Mollusks from Bowden,Jamaica", Carnegie Institution of Washington,Publication No. 385, 1928, on pages 177,178 in his description and discussion of his new genus Glyphoturris discusses this problem at length. Dr. Woodring suggests the use of Bela Gray for Mangelia auct.

In any event it seems certain that the species grouped under this name by Dr. Dall in Bull. 112 will be allocated to a number of different genera. Dr. Paul Bartsch has described several new genera to take a number of the species in his recent papers referred to above.

Dr. Dall spelled this name Mangilia on the theory that the original spelling Mangelia was a typographical error. However, it has been my understanding that unless the original spelling was suchas to make the name fail to comply with the Rules, the original spelling must stand even though the author himself should attempt to correct it in later publications. This is an interesting point and I will appreciate being informed because Dr. Baily, our west coast authority on such matters, seems disposed to spell it Mangilia.

Dr. Joshua L. Baily Jr. comments on this problem as follows: (Per. Comm. May,1946) " Mangilia (Leach MS) Risso,1826. I would like to know whether in considering Mangilia striolata as the generitype you were following Grant and Gale, or whether you arrived at this conclusion independently. Grant and Gale reject Dall's claim that Bellardi designated M. costulata as type on the ground that Bellardi mentioned M. costulata only in the synonymy. But they do not say what he made it a synonym of, nor do they say what species if any he did designate as type. Until we consult Bellardi's work I do not believe we can make a choice between these two. I had prepared a letter to the International Committee about the spelling of this name, when it occured to me that the question of the type should be settled too. When the International Commission places a name on the official list they give the type as well, and as long as there is doubt as to the type this must be cleared up before any other question can be settled. Consequently it would be very helpful to me to know on what ground you reject Bellardi's supposed designation."

" Mitromorpha- This group is generally placed in the Mitridae. Grant and Gale make it a subgenus of Mangilia. They are undoubtedly correct in placing it here instead of the Mitridae, but I question them in making it a subgenus. They (and lots of others too) have made genera of shells not nearly so distinct as Mitromorpha."

In regard to the last, we discussed this genus and the species in it in our Minutes # 49, p. 33,34, June,1945. Our decision was to transfer Mitromorpha to the family Turridae but retain it as a distinct genus as suggested by Dr. Baily.

There seems to be little doubt but that the species placed under Mangelia by Dr. Dall will be allocated to a number of different genera. Dr. Bartsch in his 1944 papers described two new genera, Kurtzia and Kurtzina for certain species which will be discussed later. The other species we will simply list in alphabetical order as " Mangelia."

Furthermore, there is a general feeling that we have far too many names and that many of the described species should be placed in the synonymy of others.

Genus Kurtzia Bartsch,1944. Proc. Biol. Soc. Wash., vol. 57:62,63. Type (o.d.): Kurtzia arteaga Dalland Bartsch.(= Mangilia arteaga Dall and Bartsch,1910).

Kurtzia arteaga Dall and Bartsch,1910. Vancouver Island to San Diego, Calif. Tupe locality: Barkley Sound, Vancouver Island.
Kurtzia arteaga roperi Dall,1919. Monterey to Cape San Lucas
Type locality: Monterey, Calif.

Collecting data: Dredged off Monterey in 20 fms. on shale; also 40 fms.; off Redondo Beach, Calif. in 25-50 fms. graveland shell bottom; off Avalon Catalina Island in 25 fms.; off Ensenada,Todos Santos Bay, Lower Calif. in 20fms.; (Burch); off San Pedro in 10 fms. (White) (San Diego Museum).
Kurtzia gordoni Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57,p. 65.
Type locality: off Santa Cruz, Calif. in 43-46 fms. on green mud bottom.

The description follows: Shell small,very elongate-conic, wax colored. The nucleus consists of an initial stage of 1.5 smooth turns followed by a fraction of a whorl that shows a couple of weak, rounded, flattened spiral threads. This is succeeded by two turns having strongly developed axial ribs whichare protractively curved and narrower than the spaces that separate them, and 2 spiral cords, one of which forms the strong median angle, while the other is located half way between this and the suture. The postnuclear whorls are strongly angulated in the middle with the gently sloping shoulder posterior to this. Theyare marked by almost vertical axial ribs,of which 9 are present on the penultimate and the last turn. These ribs are very strong and about half as wide as the spaces that separate them. The spiral sculpture consists of a strong cord on the middle of the turns which marks the angulation,and a lesser cord midway between this and the periphery, the periphery being marked by another strong cord. Between the summit and median angulation, 13 slender rounded spiral threads are present, 3 additional ones occuring on the cord at the anglewhile the space betweenthisand the cord anteriorto it is marked by 7 similar threads; the cord itself also bears 3 threadsand the space between thisand the sutural cord bears 8 spiral threads with 3 additional threads on the peripheral cord. These cords are rendered minutely nodulose by the axial threads whichare about as wide as the spaces that separate them. The nodules are very regular and rounded and give to the surface of the whorls a finely granulated appearance. Base rather long and marked by 4 spiral cords about half as strong as those on the spire between which finely granulose spiral threadsare present. Of thse, 6 are present between the periphery and first cord, 5 between thatand the second cord, and 4 between thatand the third cord. The columella is slender, slightly twisted and bears spiral cords which become consecutively weaker fromthe insertion to the tip of the columella. Nine of these spiral cords are present, and betweenthem finely granulose threads. The fine nodules of spire, base,and columella are of similar strength and give that finer sculpture a quite uniform aspect. Aperture elongate-ovate. The outer lip with the posterior sinus between the summit and the median angulation. This is rather deepand rounded. Anterior to the sinus the outer lip is protractedand rendered sinuous by the heavier axial sculpture. Anterior canal moderately broad and moderately long. The inner lip appears on the columella as a resorption area which extends up on the parietal wall. The operculum is thin, oval with apical nucleus and concentric lines of growth. The radula bears dagger- shaped marginals only." Type has 7 postnuclear whorls-Ht. 10mm.; greater diam. 3.5"

(con.)

" This species was refered to Mangelia arteaga ropori Dall by Dall , but is sufficiently distinct to merit specific separation. It is much larger than ropori with a much more acutely sloping shoulder and much shorter aperture."

- Genus Kurtzina Bartsch,1944. Proc. Biol. Soc. Wash. vol. 57,p.64.
Type (o.d.); Kurtzina beata (Dall) (= Mangelia (Kurtziella) beata Dall.)

Dr. Bartsch states that there are a number of westcoast species in this genus ranging from California to the Gulf of California but does not state what species. They will therefore be contained in our list of"Mangelia"

" Mangelia" alesidonta Dall,1919. Catalina Island, Calif.
" Mangelia" aleutica Dall,1871. Cape Sabine, Arctic Ocean to Fuca Strait . Type locality: Unga Island, of the Shumagin Group in the North Harbor.
" Mangelia" althorpi Dall,1919. Granite Cove, Port Slthorp, Alaska (Type Loc.), and Craig, Pr. of Wales Id. and Chicagoff Id., Alaska (I. Norberg) (Eyerdam).
" Mangelia" barbarensis Oldroyd,1927. New name for M. angulata Carp,1865. Type locality: Santa Barbara, Calif.

Many of us have been following Mr. George Willett in placing this species in the synonymy of variegata Carpenter.
" Mangelia"beta Dall,1919. Point Ano Nuevo, Calif. in 67 fms.

We identified specimens as this species from our dredgings off Santa Monica, Calif. in 15-25 fms. and also off Palos Verdes in 25-50 fms., but were convinced by Mr. Willett's specimens that beta should be placed in the synonymy of variegata Carpenter.(Burch).
" Mangelia" carlottae Dall,1919. Off Queen Charlotte Islands, British Columbia in 876 fathoms.
" Mangelia" cesta Dall,1919. Monterey to San Pedro.to San Diego (White) Type locality: San Pedro. Coll. Data: San Pedro (Lowe); Cayucos,Calif. (Burch); Pt. Loma (White).
" Mangelia" cetolaca Dall,1908. Lower Calif. to Salina Cruz, Mexico. This species is probably not found in our Recent fauna although common enough in many of our Pleistocene deposits. Grant and Gale placed it in the synonymy of perattenuata Dall,1905 . However, Mr. George Willett in his Baldwin Hills paper, Trans. San Diego Soc. Nat. Hist,1937, p.395 took issue with this and held cetolaca to be distinct.
" Mangelia" constricta Gabb,1865. Catalina Island in 80 fms.
" Mangelia" crebricostata Carpenter,1865. Forrester Island, Alaska to Monterey, Calif. Type locality: Neah Bay, Wash.

Collecting data: Victoria, B.C. (Eyerdam).
" Mangelia" eriopsis Dall,1919. Forrester Island, Alaska and the Queen Charlotte Islands. Type locality: Forrester Island.

Grant and Gale place this species in the synonymy of Lora alaskensis (Dall). ?
" Mangelia" eriphyle Dall,1919. Off Esteros Bay, Calif. to Coronado Islands. Type locality: off Santa Rosa Island.
" Mangelia" evadne Dall,1919. Off Santa Rosa Island, Calif. in 53 fms.
" Mangelia" granitica Dall,1919. Granite Cove, Port Althorp, Alaska.
" Mangelia" hamata Carpenter,1865. Ann. and Mag. Nat. Hist. Ser. 3, vol. 15, p. 399, May,1865, reprinted in Smithsonian Misc. Coll. No. 252. p. 293, (bottom pagination),1872. Dall, Proc. U.S.N.M., vol. 56,p.71,1919. Erie Knight Jordan in Bull. So. Calif. Acad. of Sci.,vol.23,1924, p.154 gives the range of this species as San Diego (Gripp), Pt. Sbreojos) H.)

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to Panama. Dr. Dall states that the type specimen resembles a fossil suchas found in the Santa Barbara Pleistocene. In any event this species seems to be greatly misunderstood. Mr. Wm. K. Emerson of San Diego,sent me some specimens that heand others had been collecting alive on sponges on the pilings in Mission Bay and identifying as this species. The shells were the same species we have been labelling M. merita Hinds. Dr. Dall stated that the type of hamata resembles a Cytharella. Grant and Gale suggest that it may be identical with Philbertia canfieldi. Dr. A.M. Keen listed it as a member of out Recent fauna on the Eric Jordan reference, but in the light of the above comments perhaps we should first find out what it really is.

" Mangelia" hebe Dall,1919. San Diego.

" Mangelia" hecetae Dall and Bartsch,1910. Vancouver to San Diego.
Type locality: Barkley Sound, Vancouver Island, B.C.

We have been following Mr. George Willett in placing this species in the synonymy of M. variegata Carpenter. Grant and Gale do not recognize or rather agree with this and use both variegata and hecetae. They place angulata - barbarensis and beta in the synonymy of this species.

Eyerdam reports it from Victoria, B.C.

" Mangelia" hooveri Arnold ,1903. San Pedro to San Diego, Calif.
Type locality: San Pedro Pleistocene.

Apparently the only record of this species Recent is to be infered f from Dall's range. Grant and Gale state that it is close to variegata.

" Mangelia" interfossa Carpenter,1865. Discussed as Mitromorpha in Minutes 49: 33,34.

" Mangelia" interlirata Stearns, 1871. Monterey to San Martin Island (Baker). Type locality: Monterey.

Grant and Gale place cesta Dall,1919 in the synonymy.

Collecting data: Dredged off Monterey and also Pacific Grove in 15-20 fms. (Burch); San Diego (Gripp); San Clemente Island (Lowe);

" Mangelia" fredbakeri Pilsbry,1932. Nautilus 45:124,125. This species is a Lower Californian species and not reported from our fauna. Dr. A.M. Keen advises as follows: " For M. lineolata read M. fredbakeri Pilsbry 1932. (Nautilus 45, p. 124, pl.11, fig.11). Type locality: San Hipolito Pt., Lower California. As Pilsbry shows the true lineolata of Reeve is not our west coast shell."

Addition and Correction-

Anachis (Chauvetia) lineolata (Gray in Reeve),1846. Reeve, Conch. Icon. vol. 1, Pleurotoma, pl.37, fig. 337. Grant and Gale, 1931, p. 686, pl.26, figs. 31,34 discuss this species.

Range: Catalina Island to Panama and the Galapagos Islands (Dall). Grant and Gale describe it more fully. This species was overlooked in our discussions of Anachis, Minutes 51:22,23.

" Mangelia" levidensis Carpenter,1864. Bering Strait to Monterey, Calif. Type locality: (advice of Dr. A.M. Keen) " The type locality of M. levi--densis Carpenter,1864 is Puget Sound- Vancouver Island.

Collecting data: dredged off San Juan Islands,1940 (T. Kincaid); Monterey; Puget Sound (Oldroyd), Unalaska, Aleutian Islands (Eyerdam).

" Mangelia" newcombei Dall,1919. Vancouver Island to Drake's Bay,Calif.
Type locality: Clayoquat Sound, Vancouver Island.

Grant and Gale place newcombei in the synonymy of crebricostata Carp.

" Mangelia" pulchrior Dall,1919. New name for M. nitens Carpenter,1864. Monterey, Calif. to Magdalena Bay, L.C. (Dall). Type Loc.: Sta. Barbara.

It has been my policy to place pulchrior * nitens in the synonymy of variegata following George Willett and also Grant and Gale on this. However, there is a difference of opinion. We have shells labelled pulchrior from Allyn G. Smith collected at Pacific Grove, Calif. However, see the discussion of variegata. Dr. A.M. Keen in Abridged Check List gives nitens Carp. with pulchrior apparently in synonymy.

" Mangelia" nunikavensis Dall,1919. Nunivak Island, Bering Sea.

" Mangelia" oldroydi Arnold,1903. This species was lat r renamed M. cetolaca . We mention it because it was listed by Dall in Bull. 112 giving only Pleistocene of San Pedro. However, Mr. George Willett in one of his early papers, Nautilus 33:21 reports it from Forrester Island, Alaska. As discussed above Grant and Gale followed by others have placed cetolaca in the synonymy of perattenuata Dall, but this has not been fully accepted.

" Mangelia" oenoa Dall,1919. San Pedro, San Diego to Gulf of Calif.(Dall). Type Loc.: San Pedro, Calif.

This species is placed in the synonymy of variegata by both George Willett and Grant and Gale. We have been following them.

" Mangelia" painei Arnold,1903. San Pedro to San Diego (Dall). Type Loc.: Pleistocene of San Pedro.

Grant and Gale made this a subspecies of merita which we will discuss under Cytharella. However, we have no Recent records of the species, and Dall's range seems to be the only basis for retaining it in our fauna under any name.

" Mangelia" perattenuata Dall,1905. Monterey, Calif. (Dall). See discussion under cetolaca. Also Grant and Gale, 1931, p. 591. George Willett, Trans San Diego Soc.vol.8,p. 395.

" Mangelia" philodice Dall,1919. Point Ano Nuevo , Calif. to Coronado Islands. Type locality: off Pt. Pinos Light, Monterey.

" Mangelia" rhyssa Dall,1919. La Jolla, Calif. to Gulf of California. Dr. A. Myra Keen advises " " Type locality of M. rhyssa is according to the holotype label Gulf of California.

Collecting data: La Jolla, Calif. (Sweet) (Beckwith) (Bristol).

" Mangelia" sculpturata Dall,1886. Chiachi Islands to Port Etches, Alaska (Dall). to Monterey (Berry) and to San Diego (Gripp). Type locality: Aleutian Islands. Eyerdam reports it from Queen Charlotte Islands, B.C. The accuracy of the Monterey and the San Diego records may well be questioned.

" Mangelia" tersa Dall,1919. San Diego, Calif.

" Mangelia" variegata Carpenter,1864. Brit. Assn. Adv. Sci. Rept. for 1863, p. 658, 1864; Ann. and Mag. Nat. Hist., Ser. 3, vol. 15,p. 394, 1865; descriptions reprinted in Smithsonian Misc. Coll. no. 252,pp. 144, 284,1872. Grant and Gale,1931, pp. 590,591. Willett, Trans. San Diego Soc. vol.8, pp. 394,395, 1937.

Range : Monterey to Gulf of California. /Alaska south to Type Loc.: Santa Barbara. Mr. George Willett in his Baldwin Hills paper referred to above gives the following: " Mangelia (Beta) variegata Carpenter.- Syn. M. angulata Cpr. not Reeve (Arnold,1903; Dall,1921): M. oenoa Dall, M. pulchrior Dall, M. beta Dall (Dall,1921; Oldroyd,1927): M. barbarensis Oldroyd (1927), " M. hecetae Dall and Bartsch" (Grant and Gale,1931).- (1800). Our specimens of this species exhibit every variation between typical variegata

(con.)

and the other forms listed in the above synonymy. Plate 26, fig.1, shows intergradation between the two extremes, typical variegata on the one hand, and the angulated variety on the other. That this intergradation also occurs at the present time is indicated by specimens in the writer's collection. While, as Grant and Gale point out (1931, p. 593), the shell of M. hecetae Dall is indistinguishable from some specimens of the angulated form of variegata, an example of hecetae in the writer's collection, taken in southeastern Alaska, possesses an operculum, which, according to our present understanding, would place it in the genus Lora."

Collecting data: off Monterey in 20 fms. shale, common; off Santa Monica, 15 fms.; Redondo Beach 15-50 fms.; off Avalon, Catalina Island in 25 fms.; off Ensenada, Mexico in 15-50 fms.; littoral at Anaheim Landing; Palos Verdes; Malaga Cove; (Burch); off Friday Harbor, Wash. (T. Kincaid) (Burch).

Genus Cytharella Monterosato,1875. Type (s.d. Woodring,1928, p. 168) : Murex costatus Donovan. Recent, Europe. Dall's 1918 (p.325) designation of Pleurotoma bertrandi Payraudeau considered invalid by Woodring,1928, p. 168.

Cytharella aculea Dall,1918. San Diego, Calif. to Cape San Lucas.
Type locality: San Diego, Calif.

Cytharella amatula Dall,1919. Monterey, Calif. (Oldroyd in Stanford Coll.) south to San Diego,Calif. Type Loc. : San Diego. San D.(Mrs. Oldroyd)

Cytharella branneri Arnold,1903. San Pedro to San Diego, Pleistocene and Recent to Panama. Type locality: San Pedro Pleistocene.

Grant and Gale place this in the synonymy of hexagona Gabb.

Stanford University collection collection has sets from San Pedro and San Diego collected by Gripp. / to Todos Santos Bay (Burch)

Cytharella hexagona (Gabb),1865. Monterey to San Diego. Panama (Dall)? Type locality: " One specimen from Catalina Island, 40 fms., another from the beach at Monterey."

Grant and Gale consider this " Mangelia s.s.".

Collecting data: dredged off Monterey in 20 fms. shale; off Redondo beach in 15-25 fms., common; off Avalon, Catalina Island in 25 fms.; off Malaga Cove in 15 fms.; off Ensenada, Mexico in 15 fms. (Burch); Catalina Island in 50 fms. (Lowe); South Coronado Island in 10 fms. (Baker).

Cytharella hippolita Dall,1919. San Diego to Lower Calif. Nicaragua (Lowe)
Type locality: San Hippolito Pt., Lower Calif.

Collecting data: San Juan del Sur, Nicaragua (Lowe); San Hippolito Pt., L.C. (Lowe).

Cytharella louisa Dall,1919. San Luis Obispo, Calif.

Reported from Cayucos,Calif., San Luis Obispo Co. (Lowe)(San Diego Mus.

Cytharella merita (Hinds),1843. Monterey, Calif. to Mazatlan,Mex.(Lowe) to Central America. Type locality: Gulf of Nicoya,Central America.

Grant and Gale consider this Mangelia s.s.

Collecting data: San Simeon,Calif.; Cayucos,Calif.; Dana Pt., Orange Co., Calif.; Bird Rock, San Diego Co.; Mission Bay, San Diego Co.; Punta Banda, Lower Calif. (Burch); Mazatlan, Mexico ; Tepoca Bay, Sonora(Lowe).

Subgenus Agathotoma Cossmann,1869. Nom. nov. for Ditoma Bellardi, 1877. Type (monotypy): Mangelia augusta Jan. Miocene and pliocene,Europe.

Cytharella densilineata Dall,1921. San Pedro to Guld of California (Dall). Dr. A. Myra Keenadvises regarding the type locality of this species as follows: " The date for C. densilineata Dall is 1921. The type locality is presumably that of the specimen Arnold figured, which should be Pleistocene of Signal Hill (" San Pedro series of Los Corritos") . Dall bestowed a new name without selecting a type specimen. Before the species is on firm footing someone must select a lectotype from among Arnold's specimens which are at Stanford."

Grant and Gale, 1931, p. 590 place this species in the synonymy of variegata Carpenter, placing it under " Mangelia" (Beta).

Collecting data: The San Diego Museum has a set labelled by Lowe as this species from off San Pedri in 15 fms.

Cytharella fusconotata Carpenter,1864. Laguna Beach, Calif. to Gulf of California. Type locality: Cape San Lucas, L.C.

Cytharella janeita Dall,1919. San Diego, Calif. to ~~Scammon's Lagoon.~~ Catalina Island (Lowe). ~~Type locality: San~~ Diego, Calif.

Collecting data: off Catalina Island in 30 fms. (Lowe).

Cytharella pomara Dall,1919. San Pedro, Calif. (Lowe).

Genus Daphnella Hinds,1844. (p. 25). Type (s.d.) Hermannsen 1847, p. 370): Pleurotoma lymnaeformis Kiener. Recent," Indian Ocean and Ile de France".

Mr. A.M. Strong comments on the species placed here by Dr. Dall in Bull. 112 as follows: " Bartsch states that " Daphnella" clathrata Gabb belongs in the genus Eudaphana Bartsch. I do not know what D. fuscoligata Dall is but I do not think it belongs here."

" Daphnella" clathrata Gabb,1865. San Miguel Island to San Diego and Cortez Bank, Calif. Redondo Beach, Calif. (Burch). Type locality: Catalina Island in 60 fathoms.

Collecting data: Off Redondo Beach in 100 fms. (Burch); off Catalina Island in 30 fms. (Lowe); off Newport in 30 f,s. (Lowe).

" Daphnella" fuscoligata Dall,1871. Monterey to San Diego, Calif. Type locality: Monterey, Calif.

Grant and Gale renamed this species Mangelia crassaspera (1931 p 599). They placed the species in Mitromorpha which they considered a subgenus of Mangelia making the name fuscoligata preoccupied by rigida fuscoligata Carpenter. However, this proceedure has not been accepted generally.

Collecting data: Dredged off Monterey in 20 fms. on shale; also off Redondo Beach in 50 fms.; off Malga Cove, L.A. Co. in 40 fms. (Burch); Laguna and Long Beach (Lowe);

Genus Taranis Jeffreys,1870. (p. 447). Type (monotypy): T. morchi Malm. Recent, Norway to Mediterranean, Atlantic Coast of U.S.A. to Gulf of Mexico.

Dr. Paul Bartsch in Nautilus 57:107,1944 in the notes states that it may become necessary to take Taranis out of the Turridae and make Taranidae a separate family. Soft parts do not fit the Turridae etc.

Taranis strongi Arnold,1903. Forrester Island, Alaska to San Diego. Type locality: San Pedro Pleistocene. Collecting data: Dredged off Redondo Beach, Calif. in 100 fms. mud bottom (Burch); Alaska (Lowe Collection).

The following keys and data are taken from Mr. A.M. Strong's notebook.

Genus Turricula

Fasciole broad, concave, canal moderate to long ..... Turricula
. Shell elongate, with nodes or short ribs below the fasciole(Turricula s.s.
.. Spiral sculpture of slender cords
... Axial ribs about 8 ....nigricans
... Axial ribs about 12 ....naura (crusospira)
.. Spiral sculpture of fine striae only
... Axial ribs short, curved, protractice ....libya
... Axial ribs reduced to small, sharp nodes ....maculosa
. Shell fusiform, axial ribs indistinct ....(Pleurofusia)
.. Periphery with two spiral cords
... Peripheral spiral cords nodulous ....fusinella
...Peripheral spiral cords smooth ....dolenta
... Posterior peripheral cord stronger than anterior ..armilda
.. Periphery angulated with a single spiral cord
... Shell yellowish to light brown ....lavina
... Peripheral keel with regular brown spots .... arcuata

Genus Clavus

Spiral sculpture of cords or raised threads ....(Clathrodrillia)
. Whorls rounded, with distinct axial ribs
.. Spire with 4 or 5, body whorl with 1x spiral cords ..paxiana (sculpta)
.. Spire with 4, body whorl with about 20 spiral cords ..nautica
.. Spire with 7, body whorl with about 25 spiral cords ..callianira
. Whorls angulated, with the spiral cords predominating
.. Spire with 1, body whorl with 9 spiral cords
.... Anal fasciole spirally striate .... halis
... Anal fasciole smooth ....soror
.. Spire with 1 or 2, body whorl with 6 or 7 spiral cords ..thestis
.. Spire with 2, body whorl with 8 spiral cords ....jaculum
.. Spire with 2 or 3, body whorl with about 12 major spiral cords.alcestis
.. Spire with 3, body whorl with 6 spiral cords .... holiplexa
.. Spire with 2 major and 2 minor spirals, body whorl with 18..adonis

Clavus panthea Dall of G. and G., p. 580, is described as without a callus and for this reason and others does not belong here.
Clavatula halis Dall of G. & G. p. 485, is described as not mature and nothing is said about the presence or absence of a callus. In other ways it clearly belongs in the group with Clathrodrillia.

Whorls with a distinct subsutural band .... (Crassispira)
. Axis of last whorl set at an angle with that of the spire
.. Body whorl with a single spiral row of small tubercles ..luctuosa
.. Body whorl with about 8 nodulous spiral cords ....loxospira
.. Body whorl with a spiral row of nodules on each side of fasciole.rudis
.. Body whorl with axial ribs ....excentrica
. Shell uniform turrited or biconic
.. Axial sculpture faint or wanting
... Sutural band with a smooth carina
.... Shell uniformly black or dark brown
..... Body whorl with a row of nodules and 2 rows of granules..aterrima
(con.)

..... Body whorl with many rows of nodules........... cerithoidea
..... Body whorl with 4 or 5 spiral cords, upper one undulated and uniform black .... grandimaculata
..... Body whorl with elongated peripheral nodes and 8 cords. fonseca
....'Shell dark with a subtranslucent band above the nodules.melchersi
.... Shell dark, raised sculpture banded white or yellow
..... Body whorl with a keel and 3 rows of granules ...collaris
..... Body whorl with 2 dark and 2 light keels ......zonulata
..... Periphery with sharp tubercles, base with distant spirals.albonodosa
..... Body whorl with about 12 spiral cords, peripheral ones paired.nephale
.... Shell yellow
..... Spire with a fine beaded cord between 2 rounded keels. cincta
.. Axial sculpture faint or wanting
... Sutural band weakly lobed or granular carina
.... Shell uniformly black ....montereyensis
.... Shell marbled with brown and white ....amathea
.... Shell dark, the raised sculpture banded yellow or white
..... Periphery with 2 rows of nodes ....aureonodosa
..... Periphery with a single row of elongate nodes
...... Peripheral nodules 16 ....monilifera
...... Peripheral nodeules 12 ....nymphia
.. Axial sculpture distinct
... Sutural band with several small spiral cords
.... Shell uniformly livid purple .... tepocana
.... Shell dark with paler spots or bands
..... Last whorl with about 14 spiral cords .... rugitecta
..... Body whorl with 6 tuberculate spiral cords ....trimariana
... Sutural with a weakly lobed or granular carina ... incrassata
... Sutural band with a smooth keel
.... Shell uniformly dark brown or blackish
..... Axial ribs 6 .... bridgesi
..... Axial ribs 8 or 10
...... Spiral sculpture granulated .... granulata
...... Spiral sculpture distinct on the base only..... rustica
..... Axial ribs 12 or more
...... Axial ribs distinct on the periphery only
.... Axial ribs oblique, sharp .... caelata
.... Axial ribs vertical, fine .... discors
.. Axial sculpture distinct
... Sutural band with a smooth keel
.... Shell uniformly dark brown or blackish
..... Axial ribs 12 or more
...... Axial ribs extending over the base
.... Entire surface finely spirally striate .... hanleyi
.... Ribs small, numerous, somewhat numerous ....callosa
.... Spire with 3, body whorl with 21 spiral cords ... solitaria
.... Spire with 4, body whorl with 15 spiral cords ...hermanita
.... Shell with the raised sculpture banded yellow or white
..... Axial ribs 8 to 10
...... Spiral striations only axial ribs with 2 basal nodules.flavonodosa
...... Spire with fine spiral striae, 3 cords on the base ..eurynome
...... Spire with 2, body whorl with 7 spiral cords ....bacchia

(con.)

..... Axial ribs 12 or more
...... Posteriorly with irregular tuberculate spiral cords ..appressa
...... Spire with 3, body whorl with 10 tuberculate spiral cords. bicolor
... Sutural band nodulous
.... Shell uniformly dark brown or black
..... Axial ribs 8 to 10 .... unicolor
..... Axial ribs 14 or more
...... Body whorl with fine spiral striae only ......erebus
...... Body whorl with strong spiral cords
.... Ribs fading out below the periphery .... martinensis
.... Ribs reaching the canal ....sowerbyi
.... Shell dark with the raised sculpture banded with white
..... Axial ribs 12, base with 4 tuberculate spiral cords ... pluto
..... Axial ribs 14 or more
...... Ribs showing as double or triple nodes on the shoulder..arsinoe
...... Spire finely spirally striate, 4 low cords on base ..adamsiana

thiaella Kiener, tomliniana Melvill, atramentosa E.A. Smith, bottae Val., flavicarinata E.A. Smith, (micans Hinds = Clathurella).

Genus Clavus con.
Whorls without a sutural band ....(Brachytoma)
. Spiral sculpture of strong cords
.. Shell with a short spire and moderate canal
... More or less nodulous spiral cords on the spire
.... Spire with 1, body whorl with 6 spiral cords ..trimariana
.... Spire with 3, body whorl with 4 or 5 spiral cords ..candace
.... Spire with 3, body whorl with 8 spiral cords ......dirce-
grandimaculata see Crassispira
... Nodulous spiral cords confined to the base
.... Axial sculpture of 9 oval nodes ....eurynome
.... Axial sculpture of 7 or 8 short ribs .... erigone
.... Axial sculpture of 12 ribs .... abdera

Genus Clavus
Axial sculpture of ribs extending from suture to suture
. Spiral sculpture confined to the canal
.. Axial ribs nearly continuous up the spire
... Axial ribs 8 or 9 pinkish white, polished
8 x 3 mm. Gulf of Calif. ....lalage
Proc. 56, p 7, pl.20, fig. 3
... Axial ribs 10 to 11
.... White, polished 9 x 3.5 mm. Panama Bay ,51 fms. ... hespera
Proc. 56, p. 6, pl.20, fig.2
.... Light brown,brilliantly polished 9.5 x 4 mm
Head of Gulf of California -.................. palmeri
Proc. 56, p.9, pl.19, fig.7
.... Pinkish white or flesh color, polished
14 x 6 mm. Panama Bay, 153 fms. .... plicatella
Bull. Mus. Comp. Zool 43-289; Proc. 56, pl.20, fig.4
.. Axial ribs not continuous over the suture
... Axial ribs 8 to 9 7 x 2.5 mm. Panama Bay,51f....... elissa
Proc. 56, p.6, pl.20, fig.4

... Axial ribs 12-14
.... White base yellowish 14.2 x 5 mm. Pt. San Firmin,L.C...ferminiana
Proc. 56:7 pl.8:4
.... Yellowish, a dark spot on back of body whorl- 14 x 5 mm
Acapulco to Central America .... pudica
... Axial ribs 14
.... White,polished 8.5 x 3 mm near Mazatlan............attalia
Proc. 56:10 pl.18:7
. Spiral sculpture confined to the spaces between the ribs
.. Close incised spiral lines on lower part of body whorl.
... Brownish,polished. 6.5 x 2.25 mm. Todos Santos Bay ..hemphilli
Oldroyd vol.2, pl.69
.. 6 to 7 incised spiral lines on body whorl followed by 3 cords
... Brownish,glistening, ribs lighter 13.7 x 5 mm Scammons Lag.. arbela
Proc. 56;10, pl.4:3
.. 10 to 11 incised spiral lines on last whorl
... Pinkish brown,brilliantly polished- 7 x 2.5 mm. Gulf Calif...aeolia
Proc. 56:11,pl.3,fig.1
11 mm. Papagayo .... quisqualis
. Spiral sculpture crossing the axial ribs
.. Spiral lines or threads between the sutures 3 .....(Clathrodrillia)
... Intersection of axial and spiral sculpture slightly nodulous
....White 10 x 4.5 mm Cape San Martin, 218 fms. ....castianira
Proc. 56:15, pl.2 :1
... Intersection of axial and spiral sculpture strongly nodulous
.... Whitish with a brown periostracum 16.5 x 8.6 mm La Paz..andromeda
Proc. 56:16, pl.2:2
.. Spiral lines between the sutures 4 to 6
... Axial ribs 7
.... Pale pinkish brown 23.5 x 7.3 mm Gulf of Calif. ...pilsbryi
Lowe p 23, pl.4, fig.2
... Axial ribs 10 to 14
.... Fasciole narrow, slightly contracted
..... Ribs narrow, shap edged
...... Whitish 16 x 6 mm. Gulf of Calif. ....aerope
Proc. 56:13, pl.1, fig.3
..... Ribs wide, strong
...... White, polished, with touches of brown 17 x 6.5 mm
Gulf of Calif. ....ianthe
Proc. 56:9, pl.4:6
.... Fasciole strongly constricted
..... Shell pale olivaceous 13 x 5 mm. Gulf of Calif. ....paziana
Proc. 56:14, pl.5:1
..... Shell whitish or gray 22 x 8 mm Acapulco to Panama..pallida
... Axial ribs 18
.... Purplish brown with a yellowish white glaze, 18 x 6 mm
Proc.56:11,pl.4 San Pedro ....halocydne
... Axial ribs about 35
.... Warm yellow brown 7 x 3.5 mm. Gulf of Calif. .... limans
Proc. 56:14, pl.13:3
.. Spiral lines 10
... Flesh color, periphery with pinkish spots on the ribs
Lowe p.23, pl.4,fig.1 17 x 7 mm Gulf of Calif. ....acapulcana

.. Entire surface with fine spiral threads

... Rosaceous 11 x 4.5 mm. Gulf of Calif. Proc.56:9,pl.120:9..hucuba

Axial sculpture of axially elongated nodes at the periphery .. (Elaeocyma)

. Peripheral nodes 8

.. Base with smooth spiral cords

... Porcelain white, back of last whorl brown 50 x mm Gulf of Cal..unimaculata

.. Base with 4 spiral rows of nodes

... Dull waxen, darker behind the aperture- 15 x 6 mm - Panama Bay Proc. 56:;2. pl. 4:5 .....abdera

. Peripheral nodes 10 to 11

.. Yellowish, later whorls brownish with a pale per ipheral band 31 x 10 mm. San Pedro to San Diego Proc. 56:,pl.4 fig.1..empyrosa

.. Brownish, paler on the upper whorls 13x4.8 mm Gulf of Calif . Proc. 56:12, pl.4:2 ..... aegina

. Peripheral nodes 13

.. Cream color, nodes brownish 49 x 17.3 mm. Gulf Calif... pembertoni Lowe p. 22, pl.3, fig.6

Spiral sculpture of strong cords crossing the low axial ribs

. Whorls angulated with one or more peripheral ....(Carinodrillia)

.. With a single cord between the surural cords

... Surface with microscopic spiral striae- yellowish white- 20 x 7 mm La Paz ...Proc.56:17,pl.5:4..........halia

... Surface smooth 14 x 5 mm. Guaymas. Pyl. p.45,pl.2,f.4.... soror

.. With two peripheral cords

... Lower peripheral cord the strongest

.... Base with 12 spiral threads, last whorl keeled- Pale greenish brown 30 x 8 mm. Proc.56:18,pl.5:6 Gulf of Calif..... alcestis

.... Last whorl with 8 cords, followed by spiral threads

..... Fasciole wide, smooth Pale brown 27 x 8 mm Gulf Calif...haliplexa Proc. 56:19, pl.5, fig.5

..... Fasciole axially threaded Fawn colored 15 x 5.1 mm. Acapulco to Manzanillo. P & L p.45, pl.2, fig.3 ....jacula

... Upper peripheral cord the stronger

.... Pale brownish, clouded on a yellowish ground 30 x 8 mm Proc. 56:18, pl.5:3 Gulf of Calif. ....thestia

... Peripheral cords equal, close spaced. Acapulco tp Panama..duplicata

.. With two major and two minor spiral cords on the spire. Cinnamon brown, summit of ribs whitish. 17 x 5.6 mm. Pyl 45,pl2,f.2. Manzanillo ..adonis

.. With three weal cords on the spire. Grayish white above the periphery brown below 14.4 x 5.4 Manzanillo. P&L p.46,pl.2,f.5 ..dichroa

. Whorls not angulated, spire with 4 or 5 cords

.. Base with 10 spiral cords 13 x 5 mm Pro.56:14,pl.5:1. La Paz..paziana

. Whorls shouldered

.. Base with 15 spiral cords 18 x 6.6 mm P&L 44,pl2,f.1 Acapulco.nutica

.. Last whorl with 25 spiral cords. Pale brownish. 16 x 5.5 mm. Proc. 56:16, pl.5:2 Lower Calif. ....callianira

aenone Dall, Proc. 56, p.15, no fig., Gulf of Calif.
alcmene Dall, Proc. 56, p. 19, no fig. Acapulco
alocyme Dall, Proc. 56, pl.2, fig.3, Gulf of Calif.
albicostata Sby., Rve. 8, fig.62, Galapagos
clavata Sby., Rve. pl.15, fig.132, West Colombia .
rosea Sby., Rve fig.43, Central America
rugifera Sby. Rve pl.15, fig.127
splendidula Sby. Rve. pl.8, fig.60, Galapagos
sculpta Hinds, Rve. pl.18, fig.154, Panama.

Genus Clavus (Crassispira)

Axial sculpture of strong growth lines only

• Two spiral cords on the spire, five on the body whorl Crassispirella
Dark brown, cords lighter 23.5 x 8.5 mm. Panama......dirce
Proc.56:22,pl.6:3. = grandimaculata C.B.Adms. fide Lowe

Axial sculpture of elongate nodes on the body whorl

• Fasciole separated from the suture by a thread

•• A peripheral series of nodes, 3 smaller on base Crassispirella
Dark brown, with a whitish peripheral band 10 x 3 mm.
Proc. 56:21, pl.7:5. Acapulco .... eurynome

•• Eight peripheral tubercles, rest of sculpture faint. Black, tubercles
lighter. Maz. Cat. # 466 12.5 x 4.25 mm. Mazatlan .. albonodosa

• Fasciole separated from the suture by a smooth cord

•• A nodulous cord on the periphery, 5 on the base. Dark, the cords yellowish
P&L, p.52, pl.3, f.3. 12 x 4.5 Nicaragua ....loxospira

•• Two cords on the periphery, 7 on the base. Slate gray with yellowish
projections. Proc. 56;25,pl.6,f.1. 14.5 x 5.5 La Paz ... bacchia

•• Two nodulous cords on the periphery, 10 on the base. Black, projecting
sculpture yellow. Proc.56:23,pl.7,f.1. 13x5mm Panama .. nephele

•• Eight equal cords on spire and base. Uniformly black. 15.7x 6 mm.
P&L p 50,pl.13,fig.11 Gulf of Fonseca .... fonseca

•• Nodulously keeled on the periphery, a few spirals on base. Very dark
chocolate. 15 x mm Reeve pl.12,f.100 Gulf of Calif. to Ecuador
Brachytoma .. aterrima

•• Similar, many nodulous spirals on base. Brachytoma.
16 x 6.5 mm. Mazatlan. Maz. Cat. #462 .... cerithoidea

•• A peripheral row of granules, similar rows on the base. Black, granules
and keel yellow. Rve. pl.15,f.120. Ecuador .... collaris

•• A single row of small tubercles, faint on body whorl. Uniformly black.
Rve. pl.18, f.149. 15 x 6 mm. Magdalena Bay to Peru .. luctuosa

• Fasciole separated from the suture by a lobed or waved cord

•• A tuberculate peripheral cord, 5 cords on base. Black with projecting
sculpture orange. Maz. Cat. #464. 16 x 5.75mm. Gulf of Calif. to
Panama .... monilifera

• Fasciole separated from the suture by a nodulous cord.

•• A peripheral row of tubercles, five cords on base. Tea green with orange.
P&L p.51, pl.10,f.11. 17 x 6.2 mm. La Paz .... nymphia

•• Periphery with two beaded cords. Black, cords yellow
Reeve p. 16 fig.39. Ecuador .... zonulata

Axial sculpture on body whorl of short ribs

• Fasciole separated from the suture by a fine thread

•• Entire surface with fine spiral striae. Dark purple brownish, ribs whitish
Oldroyd v.2, pl.1, p.77. 17x6mm. Monterey. Crassispirella. ..montereyensis

•• Fine spiral threads above the periphery, nodose cords on the base.Olive
brown, aperture purplish. Proc.56:21,pl.7:8.20x9mm Panama ..erigone

•• Nine equal spirals above the periphery, 16 on the base. Livid purple under
the olivaceous epidermis. Proc.56:25,pl.16:5.19x8mm Cape Tepoca. tepocana

•• Series of nodes on periphery,5 cords on base. Black with nodes yellowish.
P&L p.52, pl.3:4. 11x4mm Tres Marias Islands ....trimariana

•• Two peripheral cords , 2-3 on base. Pale purple with touches of brown.
Proc.56:22,pl.16:6.7x2mm Gulf of Calif. Crassispirella candace

•• Two or 3 peripheral cords,5 on base. Black or very dark brown. 9x3.5 mm.
Proc. 56:24,pl.17:4. Panama Bay ....epicasta

.. Ribs small, numerous , and somewhat obsolete. Brownish... callosa (Rve.12:104

. Fasciole separated from the suture by a rugose band

.. Spiral sculpture absent, 2 series of basal tubercles. Black, ribs and tubercles yellow, fasciole bluish. 11.2x5.2mm Corinte. flavenodosa(P&L p.51)

.. Ribs crossed by very finely granulated lines. Light brown. Crassispirella Reeve pl.11, fig.90. Panama ....granulosa

. Fasciole separated from the suture by a smooth cord

.. Two peripheral cords, 4 on base. Grayish(probably bleached). 11x5mm Proc.56:24,pl.7:7. Panama Crassispirella ...bridgesi

.. About 15 spiral cords on the body whorl. Dull brownish black. Crassispirella 9.3x3.4 mm. P&L, p.53, pl.3, fig.6. Acapulco ....hermanita

.. About 20 spiral cords on the body whorl. Brownish black. Crassispirella. P&L, p.53, pl.3:5. 13x6.2mm. Mazatlan ....solitaria

.. With a prominent hump or varax. Blackish brown. Brachytoma Reeve pl.6:38. Panama ....discors (atramenttosa)

.. Entire surface finely spirally striated. Black,epidermis blackish brown. 9.5 x 3.75 mm. Mazatlan . Maz. Cat. #468 ....hanleyi

.. Strong spiral cords on the base. Dark chestnut or chocolate. 50 x mm Kiener p.33. Gulf of Calif. to Peru ....bottae ss

.. Ribs numerous, sharp. Brownish black. Gulf Calif. to Ecuador..rustica(Rvc.pl:91

. Fasciole separeted from the suture by 4-5 cords.

.. Body whorl with about 14 spiral cords. Dark reddish brown with a pale peripheral band. 30.5 x 10 mm. Proc. 56. San Bartolome Bay. rugitecta

. Fasciole separated from the suture by a waved or lobed cord.

.. One peripheral series of nodes, 3 on base. Marbled with brown and white. Proc.56:27,pl.6:2. 22x8mm. Acapulco. Crassispirella. amathea (?)

.. Two peripheral cords, 3 on base. Black with a peripheral series of orange tubercles. P&L p.50,pl.3:2. 10.6x4.7mm. Acapulco ......aureonodosa

.. Ribs grained and crossed by raised lines. Blackish. 40mm. Panama. Reeve pl.9, fig.76. ....incrassata ss

.. Ribs transversely ridged. Brown. Rve. pl.7:58. Galapagos..excentricus

. Fasciole separated from the suture by a nodose cord

.. Entire surface with fine, equal spiral striae. Brownish black. 24.2x9mm. P&L p.49, pl.2:10. Corinto .... erebus ss

.. Body whorl with fine striae, a few larger. Dark reddish, ribs paler. 7.5 x 3 mm. Cape San Lucas ..... Crassispirella .. appressa

.. Body whorl with about 15 small cords. Black with lighter spots on summit of ribs. P&L p.48,pl.2:11. 30.3x13.2mm. Panama........adamsiana ss

.. Body whorl with 12 rounded spiral cords (brownish). Crassispirella Proc. 56:27, pl.13:4. 18x8mm Cape San Martin,Gulf of Calif.. martensis (?)

.. Two or 3 peripheral cords, 4 or 5 on base. Dark brown with paler projections. Proc.56:26,pl.6. 17x7.5mm. Bartolome Bay. Crassispirella arsinoe

.. One spiral cord on the periphery, 4 on base. Black with an interrupted yellow band. P&L,p.49,pl.2:12. 18.6x6.8mm Gulf of Calif. ... pluto

.. Entire surface minutely spirally striated,2 prominent on base. A narrow horn colored band above the tubercles. 18x6mm. Maz. Cat.#461. Brachytoma Gulf of Calif. to Panama ....melchersi

.. Whorls tuberculate, ribs crossed by coarse lines. Chocolate brown with a white band above the periphery. 30mm. Reeve pl.7,f.50. Drassispirella Gulf of Calif. to Peru ....rudis

.. Ribs decussated.Brown,aperture blackish purple. Rve.errata fig.49 Central America ....sowerbyi

.. Spiral sculpture absent.Pale brownish black. Panama. Rve.pl.11:92. unicolor

.. Ribs tuberculated. Blackish brown,ribs yellow. 20mm.Panama..bicolor. Rve.6:40)

#62 p 39 August,1946

Genus Clathurella

Notch armored
. Outer lip thickened and dentate in the adult
.. Axial ribs indistinct on the body whorl
... Whorls angulated, with a spiral keel on the angle.
.... Spiral keel prominent..............................crystallina
.... Spiral keel not prominent..........................canfieldi
... Whorls not angulated
.... Spire with from 2 to 4 major spiral cords
..... Intersections of axial ribs and spiral cords nodulous.
...... Axial ribs nearly vertical...................... adana
...... Axial ribs protracrively oblique .... adria
..... Intersection of axial ribs and spiral cords not nodulous..cymodoce
.....conradiana
.... Spire with 5 or 6 spiral cords ....thalassoma
.. Axial ribs strong, reaching to the canal
... Spiral sculpture confined to the base
.... Axial ribs 12, spiral threads 13 ....partefilosa
............candida
... Spiral sculpture on all whorls
.... Canal distinct
..... Axial ribs 9 ....sirena
..... Axial ribs 12 to 14 ....immaculata
.... Canal very short
..... Sculpture deeply pitted, axial ribs sharp ....trichodes
..... Sculpture not pitted, axial ribs rounded. .... rava
.... affinis

Genus Mangelia

Notch obsolete at all stages, shell biconic ....(Mitromorpha)
. Axial sculpture absent ....filosa
. Axial sculpture on early whorls only ....gracilior
. Axial sculpture present on all whorls
.. 2 or 3 spirals on spire,6 or 7 on body whorl
... Aperture about ½ length of shell .... crassaspera
... Aperture about one third length of shell ....rhyssa
.. 2 or 3 spirals on spire, 10 on body whorl ....aspera
.. 4 to 6 spirals on spire, about 22 on body whorl ..... interfossa
Notch shallow, rounded in the adult
. Ribs closer, more irregular ....(Bela)
.. Whorls rounded or slightly shouldered
... Entire surface with fine spiral striae
.... Axial ribs 9 to 12
..... Spiral striae on spire about 10 .... variegata
..... Spiral striae nearly obsolete, shell glossy ... pulchrior (nitens)
..... Spiral striae crowded, indistinct...............striosa
.... Axial ribs 15 or more
..... Shell white, with 2 darker spiral lines .... oenoa
..... Shell pale lead color, with horn colored bands ...plumbea
... Spiral sculpture of grooves showing between the ribs
....Shell uniformly dark reddish brown .... interlirata
.... Shell white, with widely spaced brown lines........ cesta
... Spiral sculpture of small raised cords
.... Axial ribs about 12 .... bella (con.)
.... Axial ribs about 15 ....cetolaca

.. Whorls obtuse angulated
... Axial ribs 7 or 8
.... Spiral striae distinct, flattened .... cymatia
.... Spiral striae rather indistinct ....antiochroa
... Axial ribs 10 to 12
.... Spiral sculpture of fine, equal striae .... hecetae
.... Spiral sculpture fine more or less alternating ..... danae
.... Body whorl with about 12 spiral threads ....cyrene
... Axial ribs 15 or more
.... Spiral sculpture fine,uniform .... beta
.... Spiral sculpture nearly obsolete ....densilineata
.... Spiral sculpture of flattened threads .... crebricostata
.. Whorls sharply angulated with a cord on the angle
... Axial ribs about 7 ....antiprygus
... Axial ribs 9 or 10
.... Body whorl with 10 major spiral cords .... arteaga
.... Body whorl with 7 major spiral cords .... roperi
Notch deep, slit-like
. Axial ribs wave-like, spiral sculpture fine ....(Agathotoma)
.. Axial ribs 5 or 6
... Spiral sculpture absent or microscopic............. camarina
... Spiral sculpture on spire fading out on base ......taeniornata
... Spiral sculpture of numerous grooves
.... Shell purple brown, banded with white............. aculea
.... Shell horn yellow...................................pecata
... Spiral sculpture of numerous equal threads .... penelope
... Spiral sculpture of somewhat unequal threads
.... Axial ribs irregular, more numerous toward the apex.. hastula
.... Axial ribs sharp, vertical......................... aethra
... Spiral sculpture with every 3rd or 4th thread larger... finitima
.. Axial ribs 7 or 8
... Spiral sculpture absent or microscopic .... hippolita
... Spiral sculpture of a median and several anterior threads.. neglecta
... Spiral theeads on the anterior half of whorls stronger... niobe
... Spiral sculpture on body whorl of 4 strong threads ... phaethusa
... Spiral sculpture on body whorl of 7 obscure threads .... helena
... Spiral sculpture of fine, equal threads
.... Whorls shouldered
..... Shell fusiform, short, stout .... phryne
..... Shell subcylindrical, turrited ....euryclea
..... Shell slender, acute ....aegialea
.... Whorls not shouldered...
..... Shell stout, blunt, white, brown banded ....quadriseriata
..... Shell slender, waxen white ....melita
.. Axial ribs 10 or more
... Spiral sculpture of fine, equal threads
.... Shell subdiaphanous, tinted reddish brown .... subdiaphana
.... Shell pinkish with cinnamon axial dashes .... carissima
... Spiral sculpture of 12 grooves on base and canal ...... pyrrhula
... Spiral sculpture fine, with 3 or 5 major cords
.... Intersection of major cords and ribs nodulous ....telemon
.... Intersection of major cords and ribs swollen .... louisa
.... Intersection of major cords and ribs smooth............scammoni

The following are species listed by Mr. A.M. Strong in his notebook.

Genus Turricula
T. (Turricula) arcuata Reeve Veragus. Reeve 3, fig.15
T.(Turricula) libya Dall. Type loc. Cape San Lucas. Proc. USNM 56:2,pl.2:5
T. (Turricula) maculosa Sowerby. West Colombia. Reeve pl.6,fig.45
T. (Turricula) maura Sowerby Guayaquil. Reeve pl.6:47. in Knefastia.
T. (Turricula) nigricans Dall. Lower Calif. Proc. 56:3, pl.2:6
T. (Pleurofusia) armilda Dall. Cape Lobos, Gulf Calif. Bull. Mus. C.Z. 43:262
T. (Pleurofusia) dolenta Dall. Gulf of Panama. Bull. Mus. C.Z. 43:262
T. (Pleurofusia) fusinella Dall. Panama & Cape Lobos. Bull. Mus. C.Z. 43:261
Clavus militaris Hinds. Veragua. Reeve pl.7,fig.55
T. (Turricula) lavina Dall. West Mex. Proc. 56:4, pl.1:6.

Genus Surculites
S. (Megasurcula) carpenterianus Gabb. T.L. fossil. Grant and Gale p.498
var. tryonianus Gabb Fossil. Grant and Gale, p. 499
var. tremperianus Dall San Pedro. Grant and Gale,p. 499
S. (Megasurcula) remondii Fossil. Grant & Gale, p. 495
stearnsianus Raymond San Diego. Nautilus 20:38, fig. pl.2:4-6

Genus Turris
T. (Turris) nobilis Hinds. San Blas. Voy. Sulphur, pl.5, fig.1-2.
albicarinata Sowerby vide Tryon. Panama. PZS 1870, p.253
T. (Turris) oxytropis Sowerby. Panama . Reeve pl.3,fig.17
T. (Turris) picta (Beck) Reeve. Reeve pl.3, fig.16.
T. (Gemmula) gemmata Hinds. Magdalena Bay. Reeve, pl.10,fig.83
T. (?) rombergii Morch. Realejos. Jr. de Conch. vol.6,1857,p.284,pl.10:8

Genus Ancistrosyrinx
A. cedo-nulli Reeve. Panama. Reeve pl.14, fig.117

Genus Leucosyrinx
L. (Aforia) persimilis Dall. Panama. in 1620 fms. Bull. MCZ p.271,pl.12:2
var. leonis Dall. 'Coast of Wash. in 877 fms. Bull. MCZ 43:272
L. (Stiraxis) argeta Dall. Galapagos in 812 fms. Bull. MCZ 43:283,pl.19:8
L. (Stiraxis) aulacea Dall. Acapulco in 1879 f. Bull MCZ 43:273,pl.2:5
L. (Stiraxis) castanea Dall. Galapagos in 1322 f. Bull. MCZ 43:284,pl.1:1
L. (Stcriaxis) cingulata Dall. Ecuador in 741 f. Bull. MCZ 43:283,pl.19:6
L. (Steiraxis) clarinda Dall. Panama in 1772 f. Bull. MCZ 43:285,pl.1:3
L. (Surculina) blanda Dall. Cocos Id. in 1067 f. Bull. MCZ 43:291,pl.3:1
L. (Surculina) galapagana Dall. Galapagos in 634 f. Proc. 56:5, pl.3 :2.
L. (?) clionella Dall. Panama. in 510 f. Bull. MCZ 43:270, pl.14:3
L. (?) parella Dall. Ecuador in 1132 f. Bull. MCZ 43:282, pl.14:4
L. (?Surculina) hermione Dall. Galapagos 812f. Proc. 56:70, pl.19:6

Genus Pleurotomoides
P. calypso Dall. San Diego 822 f. Proc. 56:31, pl.9:8
P. dinera Dall. Galapagos 812 f. Bull. MCZ 43:281
P. erosina Dall. Panama 1672 f. Bull. MCZ 43:269, pl.2:1
P. esilda Dall. Panama 730 f. Bull. MCZ 43:282
P. esurians Dall. Panama 1270 f. Bull. MCZ 43:265
var. pernodata Dall Tehauntepec 2232f. Bull. MCZ 43:266
P. exulans Dall. Ecuador 1132 f. Bull. MCZ 43:265;pl.13:5
P. herilda Dall. Panama 1672 f. Bull. MCZ 43:266
P. isogonia Dall. Panama 1020 f. Bull. MCZ 43:279, pl.4:3
P. oceanida Dall. Panama 1270 f. Proc. 56:51, pl.3:5
P. sedillina Dall. Panama 1270 f Bull. MCZ 43:287,pl.13:8
P. xylona Dall. Galapagos 1360 f. Bull. MCZ 43:280,pl.2:3
? P. eurybia Dall. Cape San Quentin.359f. Proc.56:72,pl.22:2

Genus Lora

Lora brachis Dall. Galapagos 822 f. Proc. 56:41, pl.7:3
Lora elegans Moller. Norwegian Coast. Tryon vol.6:219. pl.28:50
sixta Dall. San Diego 640 f. Proc. 56:50,pl.16:2.
Lora halitropa Dall. Magellan Straits 61. f. Proc. 56:40, pl.16:6.
Lora krausi Dall/.Port Etches, Alaska. Proc. 56:46, pl.15:3
lotta Dall. Queen Charlotte Ids. to San Diego, Pr.56:47,pl.14:4
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equatorialis Dall. Ecuador 401 f. Proc. 56:44, pl.13:2.

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D.allemani Bartsch. Panama Bay Proc. 79,art.15, p.3.
D. bartschi Dall. Lower Calif. to Gulf. Proc.56:74,pl.19:4-5.
D. clathrata Gabb. Catalina. Oldroyd vol.2,p.150
D. mazatlanica P. & L. Mazatlan. Pr. Ac. Nat. Sci. Phila. vol.84:61,pl.4:7
D. panamica P&L Taboga Id. Pr. Ac. Nat. Sci. vol.84:60, pl.4:6

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Zetekia denticulata Dall. Panama. Proc. 56:73, pl.1:1.

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B. callicosta Dall. Acapulco 660 f. Proc. 24:515, vol.66, pl.21:10.
B. nychia Dall. Point Loma. 101 f. Proc. 56:38, pl. 12:2

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S. (Spirotropis) adrastia Dall. Monterey 581 f Proc.56:33, pl.19:2
S. (Spirotropis) agameda Dall. Cape San Quentin 539 f. Proc. 56:33,pl.24:2
S. (Spirotropis) chrysothemis Dall. Catalina 704 f. Proc.56:31,pl.11:2
S.(Spirptropis) cymothoe Dall. San Diego 822 f. Proc. 56:31, pl.9:3
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S. (Spirotropis) polycasta Dall. . Tillamook Bay 786 f. Proc. 56:30,pl.9:4-7
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S. (Pythlomangilia) rhodope Dall. Sta. Rosa Id 82f. Proc.56:39,pl.12:5
S. (Borsonella) abarbarea Dall. Sta. Rosa Id. 55f Pr. 56:35,pl.9:5.(Antiplanes
S. (Borsonella) agassizi Dall. Panama 1471 f Bull MCZ 43:275,pl.1:5.
S. (Borsonella) agonia Dall. Galapagos 643 f. Bull. MCZ 43:278,pl.1:6
var. altina Dall. Panama 1010 f. Bul . MCZ 43:278, pl.14:9
S. (Borsonella) barbarensis Dall. Sta. Barbara Id. 302-614f. 56:37,pl.12:6
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S. (Borsonella) coronadoi Dall. Coronado Ids. 39f. Bull. MCZ 43:277,pl.14:2
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S. (Borsonella) diegensis Dall. San Diego 822 f. Bull. MCZ 43:275,pl.13:11
S. (Borsonella) egregia Dall. Peru 2222 f. Bull. MCZ 43:279
S. (Borsonella) encella Dall. Cocos Id. 1067 f. Bull. MCZ 43:287,pl.14:11
S. (Borsonella) hooveri Arnold. Fossil. Rec. Gulf to Ecuador. Mus. MCZ 43:276
S. (Borsonella) emphale Dall. Pt. Loma 78 f. Pr. 56:38, pl.12:4
S. (Borsonella) saccoi Dall. Panama Bay. Bull. MCZ 43:277, ~~pl.~~ 322 f.
S. (Borsonella) suffusa Dall. Galapagos 634 f. 43:282,pl.14:10.

S. (Antiplanes) amphitrita Dall. Sta. Barbara Id. 638f. Proc.56:37, pl.9:1.
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S. (Antiplanes) rotula Dall/ New name.
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S. (Antiplanes) santarosana Dall. Sta. Rosa Id. 53f. Proc.56:pl.11:3
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P. torosa Cpr. Monterey. Grant & Gale p.562, pl.26:20.
P. aurantica Cpr. San Diego. (color form of moesta)
P. digna E.A. Smith. California. Ann. Mag. Hist. vol.19:499
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Genus Clavus
C. (Clavus) unimaculata Sby. Central Amer. Grnt. & Gle. p.575,pl.26:2
C. (.Clavus) pembertoni Lowe. Angels Bay,Gulf. Trans. San Diego vol.8:22.
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C. (Cymatosyrinx) hemphilli Stearns. Todos Stos. B. Grnt.&Gale p.577,pl.26
C. (Cymatosyrinx) aeolia Dall. Cape Tepoca. Proc.56:11, pl.3:1
C. (Cymatosyrinx) arbela Dall. Scammons Lagoon. Proc. 56:10, pl.4:3.
C. (Cymatosyrinx) attalia Dall. Mazatlan. Proc. 56:10, pl.18:7.
C. (Cymatosyrinx) ferminiana Dall. Pt. San Fermin. Proc.56:7,pl.8:4
C. (Cymatosyrinx) palmeri Dall. Head Gulf Calif. Proc.56:8,pl.19:7
C. (Cymatosyrinx) plicatella Dall. Panama. Proc. 56:7, pl.20:4
Group of pallida
C. (Cymatosyrinx) pallida Sby. Panama. Grnt. Gale. p. 576, pl.26, f.16-17
C. (Cymatosyrinx) aegina Dall. Agua Verde Bay. Proc. 56:12,pl.4:2
C. (Cymatosyrinx) halocydne Dall. San Pedro. Proc. 56:11, pl.4:4
C. (Cymatosyrinx) ianthe Dall. Cape Tepoca. Proc. 56:9,pl.4:6
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C. (Cymatosyrinx) johnsoni Arnold. Fossil.
C. (Cymatosyrinx) paziana Dall. La Paz. Proc. 56:14, pl.5:1.
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C. (Cymatosyrinx) elissa Dall. Panama. Proc. 56:6, pl.20:1
C. (Cymatosyrinx) hespera Dall. Panama. Proc. 56:, pl.20:2.
C. (Cymatosyrinx) lalage Dall. Gulf Cal if. Proc. 56:7,pl.20;3
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C. (Cymatosyrinx) aerope Dall. Agua Verde Bay. Proc.56:13, pl.1:3
C. (Cymatosyrinx) acapulcana Lowe. Acapulco. Tr. San Diego Soc. 8:23,pl.4:1
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C. (Carinodrillia) duplicata Sby. Central Amer. PZS 1833.
C. (Carinodrillia) haliplexa Dall. La Paz. Proc. 56:19, pl.5:5.
C.(Clathrodrillia) nautica P&L. Acapulco. Proc. Ac. Nat Sci. Phil.84:44,pl2.1
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C. (Crassispira) albonodosa Cpr. Mazatlan. Maz. Cat. #466
C. (Crassispira) adamsiana P & L. Panama. Proc. Ac. Nat. Sci. 84:48,pl.2:11
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C. (Crassispira) amathea Dall. Acapulco. Proc. 56:27, pl.6:2.
C. (Crassispira) appressa Cpr. Cape San Lucas. Proc. 56:22, pl.7:2
C. (Crassispira) arsinoe Dall. Battholme Bay. Proc. 56:26, pl.7:6.
C. (Crassispira) atramentosa E.A.S. Panama. Ann. Mag. N.H. v.10,1882,p.211.
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C. (Crassispira) aureonodosa P & L. Acapulco. Pr. Ac. Nat. Sci. 84:50,pl.3:2
C. (Crassispira) bacchia Dall. La Paz. Proc. 56:25, pl.6:1.
C. (Crassispira) bicolor Sby. Galapagos. Rve.
C.(Crassispira) fonseca P & L. La Union, San Salv. Pr. Ac. Nat. Sci.84:50
C. (Crassispira) grandimaculata C.B.A. Panama. Pan. Shells #174
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C. (Crassispira) granulosa Sby. Panama. Rve. pl.11, fig.90
C. (Crassispira) hanleyi Cpr. Mazatlan. Maz. Cat. #468.
C. (Crassispira) hartfordiana Reeve.
C. (Crassispira) hermanita P & H. Acapulco. Pr. Ac. Na . Sci. 84:53,pl.3:6
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C. (Crassispira) loxospira P. & L. San Juan del Sur. Pr. Ac. Nat Sci. 84:52
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C. (Crassispira) martinensis Dall. Cape San Martin. Proc. 56:27, Pl.13:4
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C. (Crassispira) monilifera Cpr. Mazatlan. Maz. Cat. #464
C. (Crassispira) montereyensis Stearns. Monterey. Grnt. Gale. p.581,pl.26:9
pudica Arnold, not Hinds. Pal. San Pedro. p. 208, pl.8;13.
C. (Crassispira) nephale Dall. Panama. Proc. 56:23, pl.7:1
C. (Crassispira) nymphia P. & L. La Paz. Ac. Nat. Sci. Phil. 84:51
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C. (Crassispira) rudis Sby. Monte Christi. Rve. pl.7:53
C. (Crassispira) rugitecta Dall. Bartholome Bay. Proc.56:26,Pl.7:6
C. (Crassispira) rustica Sby. Xipixipi. Rve. pl.11:91
C.(Crassispira) tepocana Dall. Cape Tepoca. Proc. 56:25, pl.6:5
C. (Crassispira) tiarella Kiener. Type loc. ?
C. (Crassispira) tomliniana Melville. Panama. Pr. Mal. Soc. 17:154,pl.12:2
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corrugata Sby.
C. (Crassispira) solitaria P & L. Mazatlan. Pr. Ac. Nat Sci. 84:53,pl.3:5
C. (Crassispira) unicolor Sby. Panama. Rve. pl.11:92.
C. (Crassispira) zonulata Reeve. Monte Christi. Rve. pl.6:39.
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C. (Brachytoma) adbera Dall. Panama. Proc.56:12,pl.4:5
C. (Brachytoma) albovallosa Cpr. Mazatlan. Maz. Cat. #465.
C. (Brachytoma) cornuta Sby. Caracas
C. (Brachytoma) erigone Dall. Panama. Proc. 56:21, pl.7:8.
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C. (Brachytoma) nigerrima Sby. Panama. Rve. 12:102.
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C. (Drillia) hexagona Sby. Guacomyo
Genus Bellaspira Conrad,1868.
B. grippi Dall. San Diego. Oldroyd v. 1, p.72, pl.11:15.
B. melca Dall. Panama. Proc. 56:29,pl.19:8
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M. amathula Dall. San Diego. Proc. 56:78,pl.21:2
M. electra Dall. Conception Bay, L.C. Proc. 56:77
M. fusconodata Cpr. Cape San Lucas. Oldoryd vol.1,p.148
M/ hebe Dall. San Diego. Proc. 56:63, pl.20:10
M. hexagona Gabb. Fossil. Rec. Monterey to San Diego.
branneri Arnold. Fossil
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M. janira Dall. San Diego. Proc. 56:76, pl.21:10.
M. merita Hinds. Nicoya. Voy. Sulphur, p.21, pl.6:20.
M. ordinaria E.A.S. Chile and Peru. Ann. Mag. N.H. v.10,1882.p.216. Tryon 6-250
M. painei Arnold. Fossil. Proc. 56:65, pl.23:3
M. (Bela) amycla Dall. Panama. Proc. 56:61,pl.20:8
M. (Bela) antiochroa P & L. Panama. Ac. N.S. p.56,pl.3:8
M. (Bela) antipoda Dall / Magellan Str. Proc. 56:41, pl.19:1.
M. (Bela) antipyrgus P & L. Acapulco. Ac. N.S. p. 57, pl.3:12
M. (Bela) arteaga Dall and Bartsch. Barkley Snd. Canada Sur. 14 N, p.11,pl.2:4
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M. (Bela) bella Hinds. Veragua. Rve. pl.18:146
M. (Bela) beta Dall. Pt. Ano Nuevo Proc.56:64, pl.22:4
M (Bela) carpenteri de Folin. Panama
M. (Bela) cesta Dall/ San Pedro. Pr. 56:71, pl.21:7
M. (Bela) constricta Gabb. Catalina. Oldroyd v.1,pt.1,p.134
M. (Bela) cymatias P & L. Acapulco. Ac. N.S. p. 56, pl.3:10
M. (Bela) cyrene Dall. La Paz. Proc. 56:62, pl.21:5
M. (Bela) danae Dall. Gulf Calif. Proc. 56:65, pl.21: 6
M. (Bela) godfroidi de Folin. Panama
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M/ (Bela) hooveri Arnold. Fossil. Rec. San Pedro to San Diego. Pal. S.P. p 212
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M. (Bela) occata Hinds. Veragua. Voy. Sulphur p.19,pl.19:10
M. (Bela) penoa Dall. San Pedro. Proc.56:66, pl.8:6
M. (Bela) variegata Cpr. Sta Barbara. Tryon vol.6,p.300,pl 22:57
M. (Mitromorpha) filosa Cpr. Sta. Barbara Proc. 15:200,pl.19:1
M. (Mitromorpha) gracilior Hemphill. Monterey. Grant & Gale p.597,pl.25:22
var intermedia Arnold. Pal. San Pedro p 223, pl.4:10.

tromorpha) interfossa Cpr. Neah Bay. Oldroyd v.1,pt.1,p.144.
v r barbarensis Arnold Smith Misc. Coll. v.50, p.20,f.1.
M. (Mitromorpha) limans Dall. Gulf Calif. Proc. 56:14, pl.13:3
M. (Mitromorpha) rhyssa Dall. Glf Calif. Proc. 56:62,pl.21:3
M. (Zetekia) gemmulosa C.B. Adams Panama. Panama Shells #173
denticulata Dall(vide Lowe) Panama. Proc. 56:73, pl.1:1.
M. (Agathotoma) aculea Dall. San Diego. Pr. 56:74
M. (Agathotoma) aegialea Dall. Magdalena Bay, 56:58, pl.18:8.
M. (Agathotoma) aethra Dall. La Paz, Proc. 56:5x, pl.18,f.6
M. (Agathotoma) camarina Dall. Galapagos. Proc. 56:30,pl.24:9
M. (Agathotoma) carissima P & L. Manzanillo. Pr. Ac. N.S. 84:58,pl.4:1
M. (Agathotoma) doris Dall. Agua Verde Bay. Pr. 56:55, pl.18:4
M. (Agathotoma) euruclea Dall. Agua Verde Bay. Proc. 56:79, pl.24 :5-11
M. (Agathotoma) finitima P & L. San Juandel Sur. Pr. Ac. N.S. 84:60,pl.4:5
M. (Agathotoma) hastula P & L. San Juan del Sur. Pr. Ac. N.S. 84:59,pl.4:4
M. (Agathotoma) helena Dall. Agua Verde Bay. Proc. 56:55,pl.18:2
M. (Agathotoma) hippolita Dall. San Hippolito Pt. Proc. 56:76,pl 21:6-8
M. (Agathotoma) hilaira Dall. Gulf Cdif. Proc. 56:61, pl.23:6
M. (Agathotoma) louisa Dall. San Luis Obispo. Proc.56:75, pl.24:3
M (Agathotoma) melita Dall. Agua Vefee Bay. Proc. 56:30, pl.24:7
M. (Agathotoma) niobe Dall. Panama. Proc. 56:77, pl.23:4-5
M. (Agathotoma) nereis P & L. San Juandel Sur. Pr. Ac. N.S. 84:59,pl.4:2
M.(Agathotoma) penelope Dall. Agua Verde. Proc. 56:80,pl.24:10
M. (Agathotoma) phaethusa Dall. Conception Bay. Proc.56:78, pl.24:1
M. (Agathotoma) phryne Dall. Panama. Proc. 56:80,pl.24:12
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despecta H. & A. Adms. and Tryon
M.(Agathotoma)pyrrhula Dall. Cape San Lucas. Proc. 56:79, pl.24:6
M. (Agathotoma) quadriseriata Dall. Gulf Cdif. Pr. 56:75,pl.24:8.
M. (Agathotoma) scammoni Dall. Scammon's Lagoon. Proc. 56:57, pl.18:1
M. (Agathotoma) subdiaphana Cpr. Cape San Lucas. Proc. 56:75,pl.24:4
M. (Agathotoma) taeniorata P & L. San Juan d el Sur. Pr. Ac. N.S. 84:60,pl.4
M. (Agathotoma) telamon Dall. Gulf Cdif. Proc. 56:58, pl.18:5
Genus Clathurella
C. affinis Dall. Cape San Lucas. Proc. Cal. Ac. Sci. v.5, pl.2:7
C. adana Dall. Conception Bay. Proc. 56 :52, pl.17:1
C. adria Dall. Sta Maria Bay. Proc. 56:52, pl.17:5
C. aspera Hinds. Guayaquil. Reeve pl.25:224.
C. aurea Cpr. Mazatlan. Maz. Cat. #472
bicanilifera Sby. Central Amer. Rve. 12,fig.103.
plus ariculosa Sby. vide Tomlin
C. candida Hinds. Veragua. Voy. Sulphur p.20, pl.6,f.18
C. canfieldi Dall. Monterey. Tryon 5:280; Amer. Jr. Conch. 7:101,pl.15:9
C. conradiana Gabb. Fossil. Grant & Gale p. 606, pl. 26:11.
cymodoce Dall. Sta. Barbara. Proc. 56:54, pl.17:6
C. ericea Hinds. Veragua.
C. fuscoligata Cpr. Panama. Proc. Zool. Soc. 1856, p.163.
C. laodice Dall. Manta Proc. 56:70, pl.21:3. Strong questions genus.
C. crystallina Gabb. Catalina. Bull. 112, pl.6:4.
lowei Dall. Catalina. Proc. Biol. Soc. Wash. 16:172
C. acuticostata Cpr. Panama. PZS 1856, p. 162.
C. hamata Cpr. Panama. Ann. Mag. N.H. 15:399. Dall questions locality.
C. immaculata Dall. Panama. Bull. Mus. Comp. Zool. 43:289, pl.1, f.9
C. impressa Hinds. Papagayo. Voy. Sulphur p.21,pl.6:23-24

C. intercalaris Cpr. Panama. Proc. Zool. Soc. 1856, p. 163
C. neglecta Hinds. Nicoya. Reeve pl.25:218
C. pardalis Hinds. Nicoya. Reeve, pl.23:196
C. partefilosa Dall. Cape Tepoca. Proc. 56:53, pl.17:4.
C. philodica Dall.Monterey. Proc. 56:66, pl.22:7. Strong questions genus.
C. quisqualis Hinds - Elogozyma. Papagayo. Voy. Sulphur p.19, pl.6:5
C. rava Hinds. Nicoya. Proc. Ac. Nat. Sci. 84:55, text fig.
C. rigida Hinds. Panama. Reeve, pl.25:216
C. serrata Cpr. Panama. PZS 1856, p. 163.
C. sirena Dall. Galapagos. Proc. 56:53, pl.17:3.
C. stromboides Sby. Panama, Reeve.
C. subangulata Cpr. Mazatlan. Maz. Cat. #473.
C. Thalassoma Dall. Cape Lobos. Proc. 56:52, pl.17:2.
C. trichoides Dall. new name. Proc. 56:62, pl.19:3.
hirsutum de Folin (not Bellardi). Panama. Tryon v.6:270, pl.30:75.
C. stonei Hertlein & Strong. Galapagos Pleist. Proc. Calif. Ac Sci.23:375,pl.
C. (Nannodiella) fraternalis Dall. Cape San Lucas. Proc. 56:60, pl.20:5
C. (Nannodiella) nana Dall. Cacachitas. Proc. 56:[illegible],59Pl.20,f.7

Genus Moniliopsis

M. briseis Dall. Drakes Bay. Proc. 56:35,pl.22:1.
M. diaulax Dall. Coronado Isl. Proc. 34:247
M. fancherae Dall. Catalina. Proc. 56:28, pl.8:3
halcyonis Dall San Diego. Proc. 56:29, pl.8:1.
M. grippi Dall. San Diego. Proc. 56:27, pl.8:2.
M. incisa Cpr. Puget Snd. Proc. 56:28, pl.12:7
cancellata Cpr. , not Sowerby. Puget Sound.
rhines Dall New name for cancellata. Proc. 56:28, pl.8:5.
ophioderma Dall. Proc. 56:28, pl.12:5.
inermis Hinds (not Bartsch). Magdalena Bay.
penicillata of authors.
M. quentinensis Dall. San Quentin Bay. Proc. 56:32, pl.9:9.

Genus Hemipleurotoma

H. benthima Dall. Panama 1270 f. Bull. MCZ 43:267,pl.1:7
H. eldorana Dall. Panama. 1270 f. Bull. MCZ 43:268, pl.14:8.
H. monochorda Dall. Panama 1070 f. Bull. MCZ 43:292, pl.13:1.
H. movilla Dall. Acapulco. 660 f. Bull. MCZ 43:285, pl.14:6.
H. peruviana Dall. Peru 1036f Bull. MCZ 43:392, pl.13:2.
H. serilla Dall. Panama 1270 f. Bull. MCZ 43:269, pl.13:6
H. vicella Dall Panama 1270 f. Bull MCZ 43:268, pl.14:5

Genus Taranis

Taranis strongi Arnold. Fossil. Grant & Gale p.572, pl.26:37

Genus Teres

T. panope Dall. Ecuador 401 f. Proc. 56:81, pl.9:2
T. zeuxippe Dall. Galapagos 40f. Proc. 56:81, pl.3:3.

Genus Burchia

Burchia redondoensis Burch. Redondo Beach. Nautilus 52:21,22,1938.
Burchia clionella Dall. Gulf of Panama.

The following comments are made by Mr. A.M. Strong in his notebook and many of them are of interest to us.

" Dall uses the genus Turricula and places under it as subgenera Knefastia and Surcula. Woodring makes Knefastia a good genus and at least for some of the shells placed by Dall in Surcula suggests the new genus Fusiturricula. He

(con.)

also states that both Turricula and Surcula are oriental groups and need not be considered in the West Indies.

Grant and Gale use the genus Clavatula and under it Knefastia as a subgenusfor the west coast shells. They also include Carinodrillia as a sectionstating that the type is like Turricula tho the other species placed in the genus by Dall are distinct. The specimen figured by Dall shows a partly formed lip, but in the description Dall states that the anal sulcus is deep and rounded which does not agree with the figure. Evidently their conclusions are based on the figure only and the section does not belong here. They also use the genus Turricula with Pleurofusia as a subgenus for shells similar to those placed by Woodring in the genus Fusiturricula. The question of the character of the nuclear whorls as stated by Woodring and Grant and Gale is one that we hardly need consider. My idea is to consider Knefastia and Fusiturricula as good genera, with a number of species.

Knefastia Dall, type Pleurotoma olivacea Sowerby, not Reeve. We have specimens of three very similar forms which evidently represent olivacea Sowerby, funiculata Val. and tuberculifera Brod. & Sby. The various figures and quoted synonymy make it difficult to say which really belongs to which name. Dall and others list Pleurotoma duplicata Sowerby as belonging here. Reeve's figure is imperfect and does not show the notch or canal. Also there is no sign of the two spiral cords for which the name is given which is mentioned in both Sowerby's and Reeve's description. Tryon copies several other figures of the species, none of which look anything like Reeve's figure. Pilsbryand Lowe identify an entirely different shell, very close to Carinodrillia alcestis Dall as duplicata Sowerby. I do not think that duplicata belongs here. Knefastia nigricans Dall certainly belongs here. Turricula maura Sowerby as I have identified it is very similar if not identical. To these I would add Turricula maculosa Sowerby. These shells are slender with a moderately long canal, the notch rather shallow, rounded, unarmed, close to the suture. The sculpture consists of short axial ribs or axially elongated nodes and a number of fine spiral threads. Turricula libya may belong here tho the canal is somewhat shorter and the spiral sculpture is absent. Turricula (Surcula) laysanica Dall is a northern shelland probably does not belong here at all. Turricula (Surcula) panthea Dall has a different notch and different sculpture and can hardly be placed here. I have a note that Drillia punctatostriata Carpenter may belong here. This is described in P.Z.S. for 1856,p.164. It has never been figured and I do not have the description. 1. This gives us the following: Knefastia dalli Bartsch, funiculata Val., maculosa Sowerby, maura Sowerby, nigricans Dall, olivacea Sowerby, tuberculifera Broderip and Sowerby, ? libya Dall, ?and punctatostriata Carpenter.

Genus Fusiturricula Woodring. Type, Turris (Surcula) fusinella Dall. The three species described by Dall, fusinella, armilda, and dolenta are closely related and perhaps intergrade. Only one was figured and I am not sure of the identification. The shell we have identified as arcuata Reeve seems to belong here. There is some doubt if we can use this name for a west coast shell, see Tomlin, Proc. Mal. Soc. vol.21, p.38. Lavinia Dall seems to be a very similar shell but larger and with shorter canal. Woodring gives a good description of the genus. We would have the following species: 2. Fusiturricula ? arcuata Reeve, armilda Dall, dolenta Dall, fusinella Dall, lavinia Dall.

Woodring describes a new genus Polystira and says that it is the American tropical representative of the Indo-Pacific Turris. He states that the west coast picta Reeve and albicarinata Sowerby belong to a subgenus under Polystira. He suggests no name for this subgenus. Grant and Gale use the name Turris for west coast shells and place picta and oxytropis Sowerby in Turris s.s.

(con.)

Bartsch in Smithsonian Misc. Coll. vol.91, no.2, p.8 shows that the type for *Polystira* as given by Woodring cannot be used and designates another species as the type. This does not seem to affect the generic characters as he describes and figures a new species from the West Indies very similar to *oxytropis* under *Polystira*. Woodring gives a good description of *Polystira* , but the type according to Bartsch should be *Murex virgo* Wood , not *Pleurotoma albida* Perry as stated by Woodring. There seems to be but four specific names applied to west coast shells which are very similar and considered identical by Tryon and others. *albicarinata* Sowerby,1870 seems to be identical with *oxytropis* Sowerby,1833. *Turris rembergii* Morch is also a synonym. I recognize three species as follows: *Polystira nobilis* Hinds, *oxytropis* Sowerby,and *picta* Beck in Reeve.

Carpenter lists *Pleurotoma gemmata* Hinds from Magdalena Bay but this locality is very doubtful. Grant and Gale give it under *Gemmula* which they make a subgenus of *Turris*. The various species described by Dall as *Gemmula* seem to belong elsewhere. The deep water and cold water shells listed by Dall under *Gemmula*, *Leucosyrinx* and *Irenosyrinx* and by Grant and Gale under *Leucosyrinx* and various subgenera are not represented in our collections.

The genus *Ancistrosyrinx* seems to be recognized generally. Woodring and Grant and Gale both describe it. We have but one species on the coast, usually listed as *Ancistrosyrinx cedo-nulli* Reeve. There is some question as to the type locality for this name. Tryon gives it as Japan. It is not unlikely that our shell needs a new name. The genus is very distinct and species from various localities are quite similar.

The genus *Lora* as used by Grant and Gale and at least in part by Dall seems to be restricted to a northern group. Grant and Gale's statement as to type is not correct as has been shown by Pilsbry and as a result their conclusions will have to be revised.

The genera *Borsonia* and *Spirotropis* with various subgenera as used by Grant and Gale seem to be a general mixture and should be separated into several genera. The group with a plication on the columella for which Dall uses the name *Borsonella* should stand, if for convenience in classification only, Also the left and right handed species they place in a subgenus *Antiplanes* should be separated in some way.

There seems to be some question about the use of the genus *Pleurotomoides* Born. Dall uses the name *Pleurotomella* Verrill , and describes a number of west coast species, all from 400 to 1000 fathoms or more.

Grant and Gale use the genus *Hemipleurotoma* Cossman, type from the Eocene of Italy. They make the genus *Cryptogemma* Dall a synonym, stating that except for the type the various species described by Dall under that name belong in *Spirotropis* etc. This is probably another case of basing definite conclusions on a figure only. All are deep water shells.

Genus *Pseudomelatoma* Dall. Type *Drillia penicillata* Carpenter. There has been much confusion in regard to the names in this genus,due to failure to recognize the small differences. *P. torosa* Carpenter is the northern, knobby form found at Montereyand that general district. I doubt if it comes south of Point Conception. *P. moesta* Carpenter is a much smoother shell found in southern California and at least as far south as Todos Santos Bay. *P. aurantia* Carpenter is a very smooth color form of this found in southern California. The Mazatlan record probably is a misidentification. Grant and Gale list a subgenus *Laevitectum* Dall. The only mention I can find of this is the one given by them where Dall lists a ? *Clathrodrillia* (*Laevitectum*) *eburnea* Carpenter. This would hardly seem to be enough to establish a subgenus.

(con.)

The shell figured by Dall as eburnea looks very much like specimens of aurantia and is said to be pinkish white. P. penicillata is a larger shell with different sculpture from the others. The Gulf of Calif. record is very doubtful. Drillia digna E.A. Smith is placed in this group by Tryon. It is unfigured and I have not seen the description.

The shells of this group form a small group ranging from Puget Sound to the outer coast of Lower California. Dall places them tentatively in Moniliopsis which he places as a subgenus of the much later described genus Clathrodrillia. Grant and Gale also use the name but place it as a distinct genus. It is very doubtful if the name should be used for our shells, but I find no suggestion of a name that might take its place. We have the following, all of which range south of San Diego or are reported from San Diego only. M. briseis Dall. Dall described thisa s Antiplanes but it seems to fit here better. M. diaulax Dall. Unfigured and described as Antiplanes. Grant and Gale place it here. M. grippi Dall. M. fancherae Dall. Described as Mangelia but later listed by Dallas Moniliopsis. According to Willett the type is a rather poor, half grown specimen of the later described M. halcyonia Dall. M. incisa Carpenter. Described as Drillia Not of Reeve. M. ophioderma Dall. Surcula ophioderma Dall, new name for Pleurotoma inermis Hinds1843, not of Partsch,1842. Usually considered a shore variety of the deeper water incisa. M. quentinensis Dall. Described as Cryptogemma but placed here by Grant and Gale. The figure indicates that it probably was correctly placed by Dall. M. rhines Dall. Surcula rhines Dall, new name for Pleurotoma cancellata Carpenter,1865, hot J. Sowerby,1827.

Genus Daphnella Hinds. Grant and Gale state that the position of the genus in the family Turridae is uncertain. Woodring uses family Daphnellinae Bartsch described a new genus Eudaphne, Proc. U.S.N.M. vol. 79, art.15, p.3. Type Eudaphne allemani Bartsch. This genus name was afterwards changed to Eudaphnella, Nautilus, vol. 47, p.76. Grant and Gale state that Daphnella clathrata Gabb is very similar to D. lymnaeiformis Kiner, the type of Daphnella. Bartsch states that D. clathrata Gabb belongs in his new genus Eudaphnella. Pilsbryand Lowe, p. 61, discuss this but do not state definite conclusions. They however retain Daphnella for the two species they describe. In this group we have listed the following: Daphnella allemani Bartsch, D. bartschi Dall, D. clathrata Gabb, D. mazatlanica Pils. & Lowe, D. panamica Pilsbryand Lowe.

Genus Mitromorpha Adams in Carpenter. Type, M. filosa Carp. Only two species definitely placed in this genus are reported from the Lower California coast. M. filosa Carpenter and M. gracilior Hemphill. Grant and Gale place Mangelia (Clathromangelia) rhyssa here. It is very unlikely that Clathromangilia Monterosato is represented on the coast. It looks like one of the species which stands all by itself tho a good series of live specimens might show differences not shown in Dall's figure. Clathrodrillia limans Dall, also mentioned by Grant and Gale, probably is not a Turrid. It has been suggested that Daphnella casta Hinds can be placed here but the canal is quite distinct and quite different from Daphnella. It seems to be another species that stands all by itself.

Kurtziella Dall. Type Pleurotoma carina Kurtz and Stimpson. The shells placed here by Dallare rather slender, with strong axial ribs and fine spiral sculpture, the whorls angulated, the aperture rather narrow, canal rather long, sinus shallow, indistinct. The following are listed by Dall. K. antipyrgus Pils. & Lowe, K. beta Dall, K. cyrene Dall, K. danae Dall, K. arteaga roperi Dall, K. cymatias Pils. & Lowe, K. antichroa Pils. & Lowe.

Genus Bela Leach in Gray. Type, Murex nebula Montagu. It is very doubtful if this name can be used for any west coast shells. Grant and Gale list a large series under it and if it is confined to rather slender shells with low,rounded axial ribs, the aperture narrow, the sinus indistinct, lip and columella smooth there will be formed a fairly distinct group as follows: Bela cesta (Mangelis), Bela cetolaca Dall (Mangelia- equals Aesopus oldroydae Arnold), B. densilineata Dall (Cytharella),B. hooveri Arnold (Mangelia), B. interlirata Stearns (Mangelia), B. cenoa Dall (Mangelia), B. perattenuata Dall (Mangelia),B. pulchrior Dall or variegata Carp. (Mangelia), B. plumbea Hinds (Daphnella).

Grant and Gale list a section Ishnula Clark in Gray . They place a few species in it and state that theyare more angulated andrelatively shorrter and broader than Bela ss. The species are as follows: B.hecetae Dalland Bartsch (Mangelia), B. barbarensis Oldroyd(Mangelia angulata Cpr Not Reeve., ? Lora antipoda Dall.

Grant and Gale list a few species which they consider to belong to Mangelia s.s. as follows: M. amatula Dall, M. hexagona Gabb, M. quentinensis Dall (Cytharella), M. janira Dall (Cytharella),M. merita Hinds (Clavatula), M. painei Arnold.

Grant and Gale use Agathotoma as a subgenus os Mangelia while Dall uses it as a subgenus of Cytharella, an indeterminate name. The species placed by Grant and Gale in Agathotoma can be divided into at least two distinct groups. There seems to be no description of Agathotoma as a restricted genus or group. As used by Dall it can be described as follows: Shell small,rather slender,sculpture with a few strong axial ribs and fine spiral threads,the aperture narrow,the outer lip varicose,the anal sukcus distinct,rounded,the varix extending around the sulcus to a junction with the body whorl, canal short or slightly differentiated.- A. camarina Dall,carissima Pils. & Lwe.,euryclea Dall,finitima P&L,hastula P&L, nereis P&L,penelope Dall,phryhe Dall,pyrrhula Dall,striosa C.B. Adms,taeniornata P&L,? Haedropleura melita Dall.

Cytharella as used by Dall is very similar to Agathotoma but is usually stouter, with more numerous axial ribs and stronger spiralsculpture. The anal sulcus is at the suture and the varicose lip does not extend to the junctionwith the body whorl. Pilsbryand Lowe use Cytharella for the shells Dall calls Agathotoma. Woodring described a new genus Ithycythara, type Mangelia pusilla Bush and designates a type for Cytharella, Murex costatus Donovan, Recent of Europe, while Dall uses a different type. The nuclear whorls, where described by Dall, are more like those of Woodring's new species than of Cytharella as defined by his new type. It looks like Ithycythara Woodring could well be used for one or both of these groups. Philbertia as described by Dall is stated to have the outer lip dentate but with the exception of two or three species allthe species described by Dall from the west coast are without denticles on the outer lip. Woodring does not recognize Philbertia in the Bowden fauna but mentions that the type is a European shell. Grant and Gale make Philbertia Dall, in part, a synonym of Mangelia, subgenus Agathotoma. I see no reason for not combining the species described by Dallas Cytharella and Philbertia in a single genus. The list would be as follows: aculea Dall (Cytharella), aethra Dall (Philbertia), cymatias Pils. & Lowe (" Mangelia"), dictynna Dall (Philbertia), dorisDall(Philbertia),electra Dall (Cytharella),? formicaria Sowerby (Pleuotoma),fusconotata Carp.(Cithara),helena Dall (Philbertia),?hilaria Dall (Philbertia),hippolita Dall(Cytharella),louisa Dall(Cytharella),?neglecta C.B. Adms. (Pleurotoma),niebe Dall (Cytharella),phaethusa Dall (Cytharella), quadriseriata Dall (Cytharella),scammoni Dall (Philbertia),subdiaphana Carpenter (Mangelia).

Genus Adelocythara Woodring is described with only one species in the Bowden fauna, the apertural armature more reduced than in Ithycythara, the outer lip with a single denticle immediately below the notch. The figure of Philbertia aegialea Dall seems to show a similar denticle (not mentioned in the description) and is otherwise a very similar shell.

" Mangelia" melanosticita Pilsbryand Lowe is the type of Stieronepion Pilsbry & Lowe. The statement is made that " This species is closely akin to " Mangelia (Clathromangelia)lineolata Reeve." of west coast conchologists. This later has been renamed by Pilsbry as fredbakeri and placed with Anachis. Grant and Gale place it in Chauvetia.

Dall describes a genus Zetekia, type Z. denticulata Dall. Lowe consid- this species to be identical with Pleurotoma gemmulosa C.B. Adams. This to be a good genus with but two species known from the coast. The shell is similar in size and shape to Mitromorpha but there is a distinct,rounded sinus. The second species is Zetekia curta and is unfigured.

Genus Cymatosyrinx Dall , type Pleurotoma lunata Lea , as figured by Grant and Gale has distinct axial ribs but is without spiral sculpture. Most but not all of the species described by Dall in the genus are smooth between the axial ribs and the genus can well be confined to such species.

Genus Elaeocyma Dall. Type, Drillia empyrosia Dall. Dall does not seem to have described this other than to designate the type. There is a small group similar to he type. Theyare large shells, over 30 mm. in length with the axial ribs and aperture similar to Cymatosyrinx but with fine, more or less indistinct spiral sculpture present. The main distinguishing character is that the back of the last whorl is smooth, more or less humped and frequently of a darker color than the rest of the shell.

Clathurella Carpenter. Type Clavatula rava Hinds. While there has been considerable question as to the validity of this name it seems to have been accepted by Woodring, Grant and Gale,and Pilsbryand Lowe. Grant and Gale's description of the genus and the synonymy of the species is not correct. Pilsbryand Lowe state that he type has not been figured on a sufficiently large scale to show all the characters and give a good figure of a typical shell. They also state that the group seems generically separable from Glyphostoma by the short , sidesiphonal sinus and the small number of transverse ridges on the columella,also the less impressed anal fasciole without the numerous subsutural folds. Their revised description of the type states that the lip is proceded by a strong varix and has a series of teethwithin. The canal is very short and there is no trace of a stromboid notch.

Glyphostoma Gabb. Type, Glyphostoma dentiferum Gabb. Grant and Gale consider this to be a synonym of Clathurella but both Woodring and Pilsbry and Lowe consider it to be a good genus. ...

There seems to be a great deal of difference of opinion as to what weight can be placed on he presence or absence of teeth on the inner or outer lip or both. Grant and Gale give almost no weight to it. Pilsbry and Lowe in Lioglyphostoma do not seem to consider low denticles on the type as important as the species they list here do not seem to have them, Bartsch in placing Glyphostomops without a denticle as a subgenus of Glyphostoma with denticles also does not seem to consider the presence of the denticles to be a generic character. It would help greatly if the character of the denticles could be considered as definite generic or subgeneric characters."

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA

September 1946

These papers are published by a group of interested students for our own pleasure. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, any person or institution will receive all papers published by our club by contributing $2.50 per year or more to our fund. Expenses are defrayed by voluntary contributions of members and friends.

We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. All interested persons are cordially invited.

Please mail all news about shells to your editor,
John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

This issue is being mailed a little early because it is probable that the editor will be called east on a business trip in September.

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The editor and a few friends have been investigating the idea of doing some dredging and collecting. We have no boat of our own and a very limited amount of tackle, dredges, trawls etc. The expense of chartering a boat and equipping an expedition with proper tools is considerable. We have been thinking about offering shares in the catch on a fair pro rata basis to anyone who might care to take a chance on a part of the dredgings. It would seem fair to allow those of us who do all of the workand use the tackle, sort the shells etc. to get our share for the effort and divide the catch among those who financed the fee charged for the boat. The details have not been worked out. If interested let the editor know. We had an idea of wworking it out so that anyone interested could get a share for a contribution to the expenses.

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More collectors should buy the " Tide Tables Pacific Oceanand Indian Ocean", Serial No. 674, U.S. Department of Commerce, Coast and Geodetic Survey, Washington, D.C.

This book is published annually, contains over 400 pages and gives the tides from Cape Horn to the Arctic on this coast as well as elsewhere. There is a similar book for the Atlantic Ocean. The cost is a mere 25¢ and about as well spent as any two bits a shell collector ever spent.

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We are now working on a complete index to our papers to date. This will cover the Pelecypoda, Scaphopoda, Gastropoda, Amphineura. It is suggested that you bind this up after receipt of the index. This will probably be late this fall.

Our next project will be to cover the fresh water fauna.

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THE CHITONS

Edited by Allyn G. Smith

Introduction

Chitons are mollusks with an articulated shelly armature consisting of eight parts, or valves, imbedded or held in place by a girdle of tough muscular tissue. They are grouped in the Class Amphineura. Dall, in Bull. 112, places them as a subclass of the Class Gastropoda. Whether this was by design or otherwise is not known as most other authors give the Amphineura a status equal to the other four molluscan Classes (Pelecypoda, Scaphopoda, Gastropoda, and Cephalopoda), which is the arrangement believed to be the proper one to follow.

The Class Amphineura is divided into two orders- the Polyplacophora, or chitons, and the Aplacophora, which are worm-like, shellless, and generally live at considerable depths.

The Order Polyplacophora is well known to West Coast collectors for the interesting variety of genera and species that live between the tides or at moderate depths from which in some localities they may be dredged in quantity. In a paper presented in 1939 before the Sixth Pacific Science Congress, Taki states that the chitons in the Pacific Ocean area number about 630 species, divided into 7 families and 92 genera.

The name Polyplacophora is not universally accepted. Iredale and Hull 2, in their monograph of the Australian chitons, refer them to the Order Loricata and call them loricates. They date the use of Loricata to Schumacher, 1817 3 and present their case for the use of this terminology in the opening paragraphs of their monograph. The case for the use of Polyplacophora is presented by Dr. S.S. Berry in a recent instructive paper " Chitons", Their Collection and Preservation" 4 in the December issue of ' Mollusca', published by Paul H. Reed of Tavares,Florida. Theile, in his ' Handbuch' published beginning in 1929 5, uses the Class Loricata , which he divides into the Orders Lepidopleurida and Chitonida.

Classification

As may already have been surmised from the above, the classification of the chitons is still in an extremely plastic state, not only with respect to the major divisions but also to the remaining subdivisions from Families down to Subgenera and Sections. Nearly every student of them has proposed an improved system, dating from Carpenter's MS., which he left unfinished at the time of his death. Dall had access to this and used it extensively in an important report on the limpets and chitons of Alaska 6, which was published in 1879. Pilsbty in the Manual of Conchology 7, put the group in good working order in 1892 and 1893. Both Dall and Pilsbry validated many of Carpenter's MS. names and descriptions, but unfortunately for the careful work Carpenter had done, under the existing Rules of Nomenclature these must be attributed and dated in accordance with the authors who subsequently gave them valid standing.

Working with the radula of chitons as a principal basis, Thiele made some changes in Pilsbry's arrangement in the Manual and to some extent these are reflected in Dall's classification in Bull. 112. Subsequently, beginning in 1923, Iredale and Hull in their work on the Australian chitons made several additional changes but as they consider the Australian forms unique in a large number of instances, their arrangement is of little assistance in the classification of West Coast species. While it is not the intention here to present a systematic arrangement that is particularly different from the one used by Dall in Bull. 112, several changes have been suggested by Dr. S.S. Berry, of Redlands, California, whose detailed knowledge of the group has been justly recognized. Where changes are made in Dall's classification the reasons for them will be stated.

Those interested in the history of the classification of the chitons will find most of it in Volume 14 of the Manual of Conchology, pages xiv-xxvi. An up-to-date classification is given by Thiele in his " Handbuch der Systematischen Weichtierkunde", Volume 1.

The Shell of Chitons

In discussing or describing chitons a special terminology had to be developed in order to call attention to the peculiarities of their shell forms and structure. Explanation of the terms more commonly used appear in a number of papers or monographs, the principal ones being as follows:

1. Dall, W.H.- Limpets and Chitons of the Alaskan and Arctic Regions with Descriptions of Genera and Species believed to be New- Proc. USNM,1878,1(48):283-285 (Published,1879). Terminology somewhat outmoded but included good figures.
2. Berry, S. Stillman- Fossil Chitons of Western North America- Proc. California Acad. Sci., 4th Ser., 11(18):422-424, May 16,1922. The best account but lacks illustrations.
3. Pilsbry, Henry A.- Manual of Conchology, Polyplacophora,14:vi-xii, figs. 1-4. A complete, though detailed account, with good illustrations.
4. Iredale and Hull- A Monograph of the Australian Loricates- Australian Zoologist, 3(#):187-189, figs. 1-4. Figures excellent showing sculptural variations in both shell and girdle.

The following definitions, taken principally from Berry, may be found helpful:

Valve (or Plate)- One of the eight " shells" of a chiton.

Head Valve- The anterior valve

Tail Valve- The posterior valve

Intermediate (or Median) Valves- The six valves between the head and tail valves, numbered 2 to 6, inclusive, from the head valve.

Girdle- Leathery muscular tissue, variously ornamented or plain, in which the valves may be slightly, partially, or wholly imbedded, and which holds them in place.

Tegmentum- The outer, usually softer surface layer of a valve.

Articulamentum- The inner, usually hard, semi-porcellaneous shell layer, which projects past the tegmentum on the sides and front of the valves to form the sutural laminae and the insertion plates.

Lateral Area- That portion of the tegmentum of an intermediate valve, often triangular in shape, lying at the side and toward the anterior, usually sculptured diagonally and set off from the central area by a diagonal ridge.

Central Area- That portion of the tegmentum of an intermediate valve lying centrally and usually differeing in sculpture from the lateral areas.

Terminal Areas- Tegmentum surface of head and tail valves.

Jugum- The longitudinal ridge of a valve, when present.

Jugal Tract- The surface of the tegmentum adjacent to the jugum.

Pleural Areas- Side slopes of valves, not including the jugal tracts.

Latero-Pleural Areas- The entire region of the slopes of the intermediate valves. In some species the boundaries between the jugal and pleural areas are more distinctly separated than those of the lateral areas (i.e., the sculpture of the pleural areas is much the same throughout).
Beak- A posterior angular projection of an intermediate valve at the jugum. When this exists, the valves are said to be mucronate.
False Beak- A similar forward projection of the tegmentum between the sutural laminae.
Eaves- Portions of the tegmentum just over the points where the insertion plates push from under it.
Eave Tissue- Character of the shell tissue of the " little cliffs" that form the eaves. It is sometimes porous or " spongy".
Insertion Plate- Narrow marginal extension of the articulamentum of a valve projecting into the girdle.
Sutural Laminae- Sharp, plate-like projections of the articulamentum from either side of intermediate and tail valves, which are overlapped by the preceding valve whch in normal position.
Jugal Sinus- The " bay" or depression between the sutural laminae. Sometimes called the sutural sinus.
Posterior Sinus- The ambayment in the anterior median line of a tail valve. It is formed by the tegmentum and sometimes also by the articulamentum.
Slits- Abrupt indentations in insertion plates.
Teeth- Portions of the articulamentum between the slits, usually most prominent in the tail valves.
Slit Rays- Slight grooves, or rows of pores that run from the slits toward the apex of a valve.

The surface of the girdle may be ornamented with scales (which may be flat or rounded, dull or polished, smooth or striated, and spaced regularly or irregularly); with calcareous spines (which may be uniform, irregular, straight, or curved); with spicules ; with hairy or bristly processes (which may be widely spaced and set in pores or closely set and bushy, simple or branching); or with a combination of such ornamentation. In the genera having a posterior sinus in the tail valve, the girdle has a corresponding sinus or slit.

The slitting of the insertion plates and the covering of the girdle, as well as certain important radular and other internal characters, form the pricipal bases upon which chiton genera are founded. In determining species it is therefore desirable to disarticulate specimens of a species that is difficult to determine. Valves may be carefully slipped out of the girdle and mounted in sequence, on narrow glass slides with a small drop of clear cement, which permits them to be studied in detail. Smaller specimens, when so treated, may be protected by placing them in glass vials or glass-topped boxes. In preparing mounts of this sort, no amount of care should be spared to keep from chipping the insertion plates, sutural laminae, or other delicate parts of the valves. As recommended by Berry, the girdle and the remaining part of the animal should be preserved in alcohol and labelled so that the valve-mount may be associated with the rest of the chiton from which it came.

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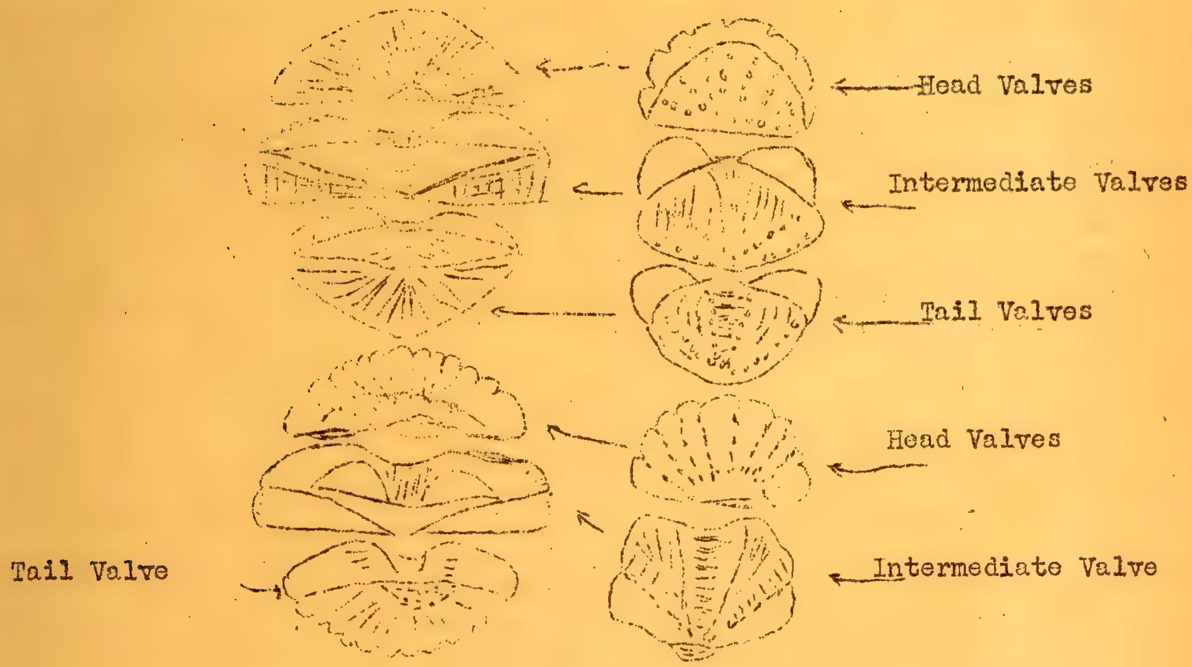
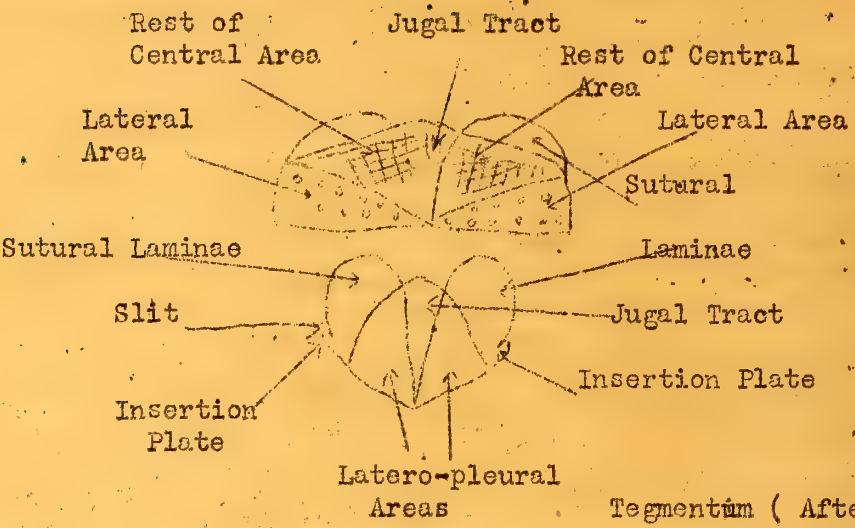
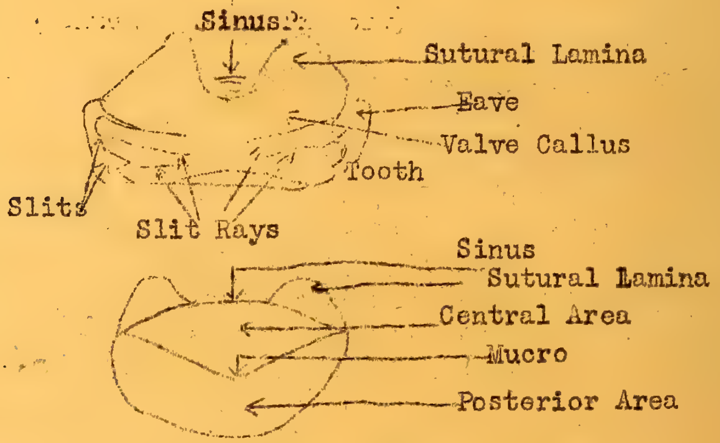
Shell Structure of Chitons



After Dall



Tegmentum (After Pilsbry)



Articulamentum (After Pilsbry)

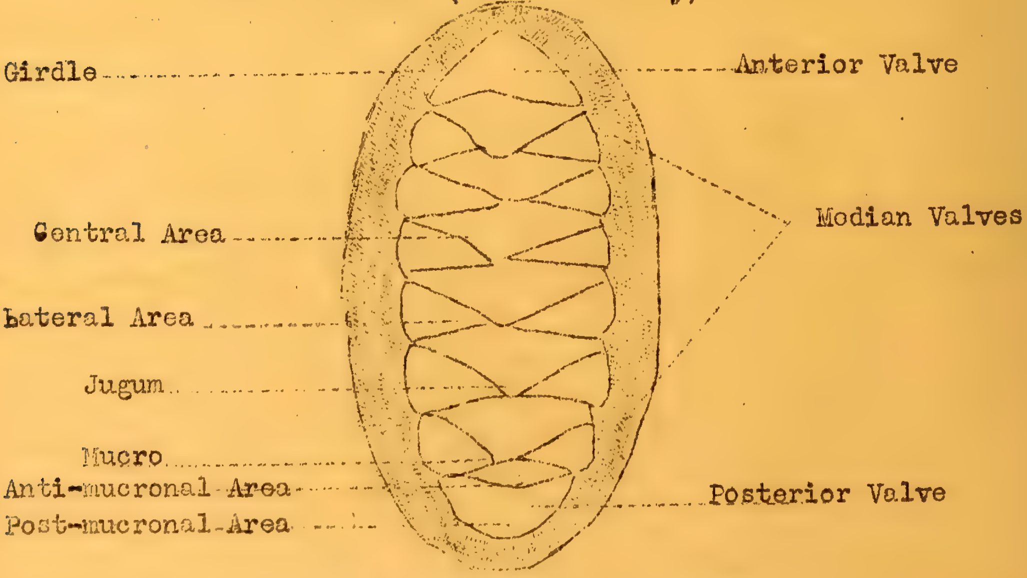
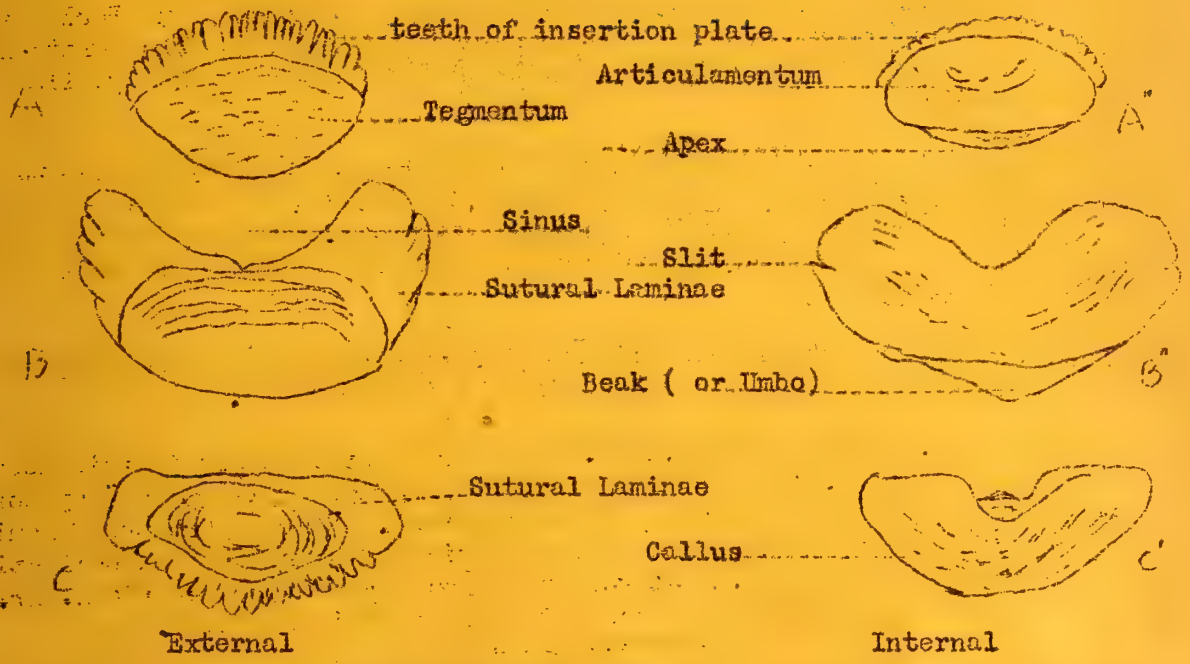


Diagram of Chiton Showing Parts (Iredale and Hull)



A,A'- Anterior Valve
B,B'- Median Valve
C,C'- Posterior Valve

(Iredale and Hull)

The chitons will be continued in our next issue.

New Publications Received

Proceedings of the Malacological Society of London, vol.27, pt.1, May,1946. There are several fine papers in this issue. One very interesting report is by A. Wrigley on the structure of lamellibranch shells. Two long papers by L.R. Cox dealing with English fossil genera and species. A paper on the genotypes of Plotisand Ampulla by R. Winckworth. Three new species of Pleurobranchidae are described by K.M. White.

Fishes and Shells of the Pacific World by John T. Nichols and Paul Bartsch, The Infantry Journal. This interesting little book is the one written for use by the U.S. military forces. The part on shells is from page 115 to 192 with 16 plates.

Fish Bulletin No. 63, The Commercial Fish Catch of California for the Years 1943 and 1944, Division of Fish and Game,California. The amounts of shell fish reported from California is somewhat amazing. For an example in the year 1944 alone they report 1,630,402 pounds of Abalone. Other items are equally surprisingly large.

Holiday, July,1946 contains a write up on shells which may be of interest to those concerned with articles written for the public.

Mollusca,vol.1, no.9, June 1,1946. There are several papers in this issue well worth comment. " Insect Pests of Conchological Collections" by Gordon E. MacMillan should be read by all collectors. " Stage Growth of Family Caecidae" by Athleen Underwood is interesting. Two articles on collecting in New Zealand, one by A.G. Stevenson and one by Arthur Richardson. Mr. C.L. Blakeslee gives an account of collecting in the Niagra River.

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F.E. Shafer, R.R.1,Trenton, Ohio. Mr. Shafer writes that he is now getting well over his war damages and hopes to be able to return to the Philippines by the coming September. He is still very much interested in getting conchological literature. He invites correspondence from other collectors.

Dr. Alexander Comfort, 20 Honor Oak Road, Forest Hill, London, SE 23, England. " Can you put me in touch with someone in your area who would exchange local freshwater,land and marine shells. I need specimens of these for research Iam doing." The above letter was written to Mr. Kenneth Rexroth, 692 Wisconsin St., San Francisco who asked Dr. Hanna of the California Academy. Mr. Rexroth says " I gather that Dr. Comfort wants shells from all over the USA and that the research is medical-zoological rather than strictly conchological, but about the latter point, Iam not so sure."

Mr. A. Sorensen, 247 Granite St., Pacific Grove, Calif. The editor and Mrs. Burch were recent visitors again to Andy's city and again enjoyed his hospitality. He made another four weeks trip to Guaymas, Mexico and as usual brought back some rather amazing things. Besides large numbers of very fine marine shells he had some specimens of a barnacle labelled Alepas rex . These barnacles has long stems perhaps a foot in length, and Mr. Sorensen said that he found them anchored as deep as 2 inches in the flesh of large black marlin. They were vicious looking things and it was difficult to immagine a barnacle being so destructive. We understand that this species is quite rare even in the larger museums. Andy seemed to have a number of them in case there are those interested in this group particularly. He also took a large number of barnacles from the large green t turtle.

[illegible] range [illegible] of [illegible] Pacific [illegible]
collected by [illegible] Eyerdam.

Mr. Eyerdam published lists of range extensions in the Nautilus, vol. 51, Jan.1938, no.3, page 100 and also Nautilus vol.51, April,1938,no.4,p.122.

The following are shells not included in the above lists.

Diadora inaequalis inaequalis Sowerby- Talara,Peru. Extension of range about 300 miles southward from Manta,Ecuador.

Cerithiopsis stejnegeri dina Bartsch,1911- Drier Bay, Knight Island,1923. Extension of range northward about 800 miles from Sitka,Alaska.

Cerithiopsis stephansae Bartsch,1909- Shuyak Strait, Afognak Island,Alaska. Extension of range northward from Port Frederick.

Bittium eschrichtii Missendorff,1849. Drier Bay, Knight Island, Alaska. Extension of range northward from Sitka, Alaska.

Neptunea satura Martyn,1784- At mouth of Yeniesi River,Arctic Ocean-Nordenskjold Expedition,1878- Voyage of the Vega- Extension of range about 3,000 miles westward from Bering Strait.

Lora althorpensis Dall,1919. Shuyak Strait (1924), Afognak Island, Alaska. Extension of range N.W. from Granite Cove, Port Althorp,Chicagof Island, S.E. Alaska.

Lora miona Dall- Unalaska, Aleutian Islands,1932. Extension of range westward from Boca de Quadra,Alaska.

Lora alitakensis Dall,1919. Shuyak Strait, Afognak Island,1924. Extension of range about 75 miles eastward.

Lora pyramidalis Strom- Akutan Island, Aleutian Islands, also Tromso,Norway. New to Alaska.

Lora reticulata Tr. - Akutan Island, Aleutian Islands. New to Alaska.

Turbonilla eyerdami Bartsch,1927. Hinchinbrook Island, Prince William Sound. Extension of range eastwardacross Gulf of Alaska from Shuyak Strait.

Turbonilla (Pyrgolampros) eschscholtzii Dall & Bartsch,1909- Izhut Bay, Afognak Island,1922. Extension of range N.W. from Port Simpson,B.C.

Odostomia chinooki Bartsch- Mud Bay, Thurston Co., Wash. (on Ostrea lurida) Extension of range northward from Columbia River, Oregon.

Odostomia (Amaura) pesa Dall and Bartsch,1909. Drier Bay,Knight Island and Raspberry Island, Kodiak Islands. Extension of range northward and westwardfrom Sitka, Alaska.

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Haliotis wallalensis- Mr. Andrew Sorensen reports the following records either of which are extensions of the published range- South of Monterey, Calif. in 100 ft. and off Pt. Buchon, San Luis Obispo County, Calif.

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Lyonsia californica haroldi Dall- We published the range of this species as being from Morro Bay north to San Francisco Bay. However, on a recent collecting trip with Mr. Allyn Smith I was informed by Allyn that this form is very common in Tomales Bay, and just to prove it I stopped and collected several typical specimens as well as a handful of Cerithidea californica Haldeman as this is the farthest north this species has been reported. The specimens seemed typical. We also did a little land shell collecting that afternoon . Perhaps the most interesting catch in this line were the Helminthoglypta nicliniana awania (Bartsch) and H. arosa miwoka (Bartsch) from Point Reyes on June 16,1946. The only thing of any particular note about this excursion was that Allyn and I parked the car comfortably in the leee side of the point leaving Mrs. J.Q. Burch there. We then after getting permission from the lighthouse officer in charge went down the ocean face of that cliff on narrow little trails with the wind just short of a hurricane. After risking life and limb we collected perhaps 40

(con.)

snails and proudly returned to the car only to have Mrs. Burch calmly show us specimens of the same species which she had taken from the ferns within a few feet of the parked car. We also took a few specimens of *Haplotrema minima* at the same locality.

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Dr. Joshua L. Baily Jr. (Personal Comm. June 12,1946) makes some very interesting comments on several species and problems. " ... on the Haliotidae. This is a peculiar family. Most modern taxonomists are splitters in every other family but lumpers in this one. To me it seems foolish to recognize so many species among the small shells like the Pyramidellidae which look so much alike, while ignoring such forms as Mrs. Williamson's *Haliotis splendidula* which to my mind is a thoroughly good species because it is so unlike any other species. Of course, it may be that the shells that we call *H. splendidula* are really something else- but in any case what we have is the most plentiful of all species of this genus on the coast- and quite distinct- so that whatever its name is, it should not be ignored. Another thing- it seems to be fashionable today to write *Haliotis cracherosii holzneri* and *H. c. lusus*- but again they are widely different. We have the types of *holzneri* and they are pathological specimens- all of them. The specimen which Mr. Kelsey wrote up in the Nautilus the year before Hemphill described *holzneri* was an alotgether different thing. I was in Holzner's store when he found this shell in a shipment of shells from Baja California and gave it to Mr. Kelsey. I was the first person to see this shell after Mr. Holzner and Mr. Kelsey. It was a very different thing- perfectly normal which had no indication whatever of ever having had holes. It is probably a good variety, but could be easily considered a species, and the form which Orcutt called *bonita* is a very interesting form because it is physiological.

The best collection of abalones I have ever seen is that which was made by Mr. Cass and which now belongs to me. When I get it out of storage I hope I can add to it and obtain some of the forms which I do not have- t the form of *H. fulgens* without holes- the form with two parallel rows of holes- th true " green abalone", etc. Eventually I shall have some of these photographed, and perhaps write an article about them at that time.

Article 19 of the code reads " The original orthography of a name is to be preserved unless an error of transcription, a *lapsus calami*, or a typographical error is present." Inasmuch as *Mangelia* was named for Mangili I assume that a *lapsus calami* is evident. Furthermore Opinion 26 authorizes the correction of *Cypsilurus* to *Cypseluris* because the former isan obvious typographical error, and Opinion 27 corrects *Ruppelia* and *Rupellia* both to *Ruppellia* not by suspension of the rules under the plenary power which the commission holds but by application of the rules.

Of course, Petit named a common species of *Polinices* after Recluz, but he called it *reclusiana* instead of *recluziana* because he felt that the letter "z" had no place in Latin and should be used only in words of Greek origin. Some later writers have assumed that this was a typographical error and have spelled the name accordingly, but there is no justification for this. In the case of *Mangilia*, the spelling with the "e" is no more or less acceptable as Latin, but as the man whom it was named for was called Mangili I have accepted the corresponding spelling.

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As for Martyn's Universal Conchologist, I have not examined this work critically. It is quite rare, probably not over half a dozen copies in the U.S. and no two of these agree in all respects. Perhaps it should be suppressed for that reason. But it seems likely that the differences between them may be due to the omission from one copy of material that is included in another, and not to contradicting statements made in material common to two copies. Personally I do not think a work should be rejected because it is not consistently binomial. We already have a rule that names which are not binomial are not available, therefore acceptance of Martyn means acceptance only of his binomial names; I can see no objection to that.

Suppose a writer prepares a treatise dealing with a limited number of forms in which he uses the binomial system. Suppose he then prepares a similar treatise in which he does not use the binomial system, dealing with a limited number of closely related forms. These two are sent to a periodical for publication. Seeing that they are dealing with closely related forms the editorunites them into a single document and publishes them. Then since about half of the names used are not binomial the work is discarded-by those who hold that works which are not consistently binomial must be rejected.

Now suppose that the editor instead of publishing the two documents as one, puts them in different issues of his periodical. The one will be accepted, the other rejected. Yet the one that was accepted does not differ in any way from the form which it had under the first " hypothesis"- and so the futility of deciding what works are not consistently binomial is demonstrated. The Conchylien Cabinet of Martini and Chemnitz is in this category. Some of the volumes have been accepted as consistently binomial-some have been rejected as not. But doubtless the rejected volumes contained some names that were as good as those in the accepted volumes- and thus they were rejected therefore as the result of the incident, if not the accident of binding. If all the volumes had been accepted, the non-binomial names would have been eliminated by application of the rule that requires all names to be binomial; by rejecting entire volumes the baby is thrown out with the bath water.

If the International Commission should reject Martyn in the same way as it has alrrady rejected Humphrey and Bohadsch and should have rejected Bolten, the question as to whether Martyn's names should be used will be settled automatically, but when such action is taken it will have to be by suspension of the rules. Therefore until such time I think we must use those of Martyn's names which are good. Probably what will happen will be that Dr. Keen or someone like her who has access to Martyn's work, will as the International Commission for a decision (I would not think of doing so, since I do not have opportunity to examine the work) and the International Commission will then reproduce some sample pages of Martyn in the Bulletin of Zoological Nomenclature, so that people like you and me can examine them and express our opinions to the Commission, who will then weigh all the opinions they receive and from them formulate their own, which will then determine the matter.

The rejection of Martyn's names will cause a great deal of confusion-so would their acceptance. I think the most satisfactory solution would be to list Martyn's names and by popular vote reject some and accept others by plenary suspension of the rules.

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Dr. Thomas A. Burch, National Institute of Health, Bethesda, Maryland.
The above is Tom's address at this time.

Solariella lewisae Willett,1946. Bulletin Southern California Academy of Sciences, vol.45, pt. 1,1946. The description follows:

" Similar to Solariella varicosa Migh. and Ad. but whorls carinated instead of rounded, varices fewer (15 instead of about 20), and inside of wide umbilicus spirally striate. Body whorl with two strong keels at the periphery, another at the summit, and a much fainter one a little in front of the suture. Whorls on the spire with single keel at the summit. Varicies continuous from spire to umbilicus, except for interruption by the double keel at the periphery of the body whorl; the strong keel at the summit is crossed and rendered nodulous by the varices. Base flattened, with about 17 fine, spiral cords. Operculum normal for the genus. Color of outside dusky with greenish sheen between the varices. Aperture subcircular, obtusely angulated on the outer lip by the peripheral keels and on the inner lip by the umbilical keel. The penultimate whorl is somewhat like that in the illustration of Cidarina carlotta Dall(U.S. Nat. Mus. Bull. 112, pl.18, fig.4), but the base and aperture are very different and the varices cross the keel at the summit.

The type, a dead specimen, No. 1084, Los Angeles Museum, was collected by Mr.and Mrs. Fred E. Lewis in 15 fathoms, at Spiridon, Kodiak Island, Alaska; a ypunger, living specimen was dredged in 15 fathoms at Galena Bay. The type has 4 3/4 whorls, and measures: Diameter, 6.1; alt. 5 mm."

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Dr. Louis Brand, University of Cincinnati has submitted the following list of shells collected in 1945 at Mayaguez, Puerto Rico.

Cymatium femorale Linne, Fasciolaria tulipa Linne,Cymatium tuberosum Lam., Cymatium aquitile Reeve, Turbo castaneus Gmelin,Cerithium atratum Born, Astraea caelata Gmelin,Livina pica Linne,Thais floridana Con.,Tectarius muricatus Linne,Turritella variegata Linne,Murex pomum Gmelin,Conus jaspiseus Gmelin,Conus spurius Gmelin(proteus Hwass),Tegula fasciata Born,Melampus flavus Gmelin,Neritina virginea Linne,Xenophora trochiformis Born,Strombus gigas Linne,Strombus pugilis Linne (juv),Distorsio clathratus Lam.,Oliva reticularis Lam.,Strombus pugilis pugilis Linne,Cypraecassis testiculus Linne, Phalium granulatum Born,Mitra barbadensis Gmelin,Conus citrinus Gmelin(mus Hwass), Littorina ziczac Gmelin,Nerita fulgurans Gmelin,Neritina viridis Linne,Nerita tessellata Gmelin,Nerita peloronta Linne,Cyphoma gibbosa Linne, Natica canrena Linne,Cypraea exanthema Linne,Cypraea cinerea Gmelin,Bulla occidentalis Adams,Trivia pediculus Linne,Archetectonica granulata Lam., Astraea longispina Lam.,Crepisula aculeata Gmelin,Diodora cayensis Lam., Fissurella barbadensis Gmelin,Conus verrucosus Hwass, Diodora listeri d'Orb., Fissurella angusta Gmelin,Vermicularia spirata Philippi,Pyrene rusticoides Heilprin,Capulus ungaricus Linne,Modulus modulus Linne,Conus regius Gmelin, Fissurella punctata Fischer,Tegula semigranosa A. Adams,Spirula spirula Linne,Antigona listeri Gray,Iphigonia brasiliana Lam.,Tellina fausta Don., Arca occidentalis Philippi,Arca secticostata Rve.,Lima tenera Chem.,Macrocallista maculata Linne,Codakia orbicularis Linne,Loripinus chrysostoma Philippi,Laevicardium laevigatum Linne,Chione intapurpurea Con.,Divaricella dentata Wood,Arca chemnitzi Philippi,Tellina lineata Turton,Donax denticulata Linne,Lima lima Linne,Venus mercenaria Linne,Spondylus americanus Hermann,Chama macerophylla Gmelin, Mytilus recurvus Raf.,Echinochama arcinella Linne,Plicatula gibbosa Lam.,Modiolus tulipus Linne,Papyridea hiatus Meuschen (spinosum), Pecten ziczac Linne, Pecten gibbus Linne, Pecten nodosus Linne.

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The following index covers the Minutes of the Conchological Club of Southern California numbers 1 to 63 inclusive in which the Pelecypoda, Scaphopoda, and Gastropoda are discussed. A separate index will be prepared for later numbers dealing with the Amphineura and other groups.

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